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THE PREHISTORY OF THE PROPOSED CLAYTON LAKE AREA, SOUTHEAST OKL--ETC(U)
1979 R VEHIK, J R GALM DACW56-78-C-0212

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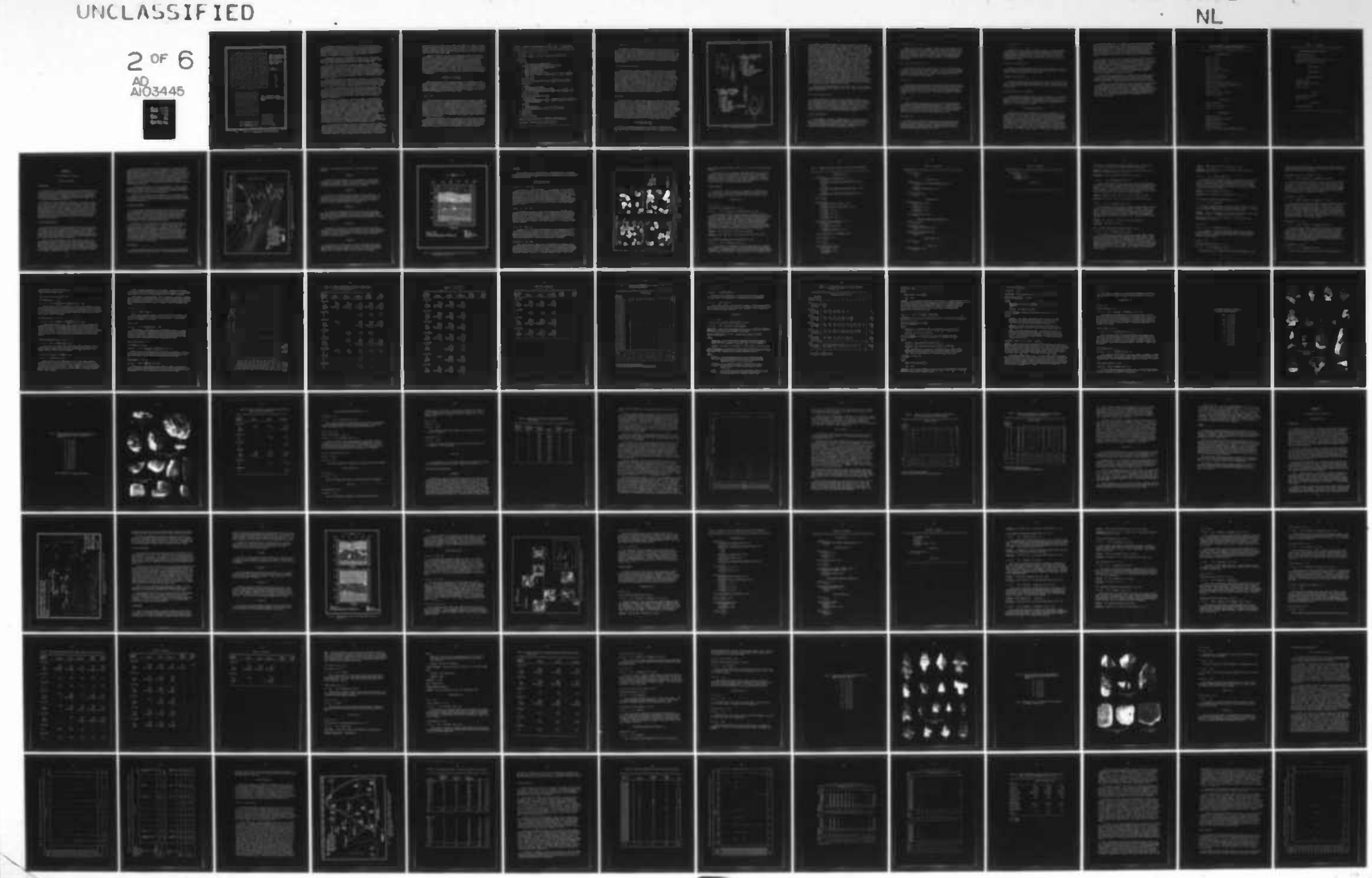


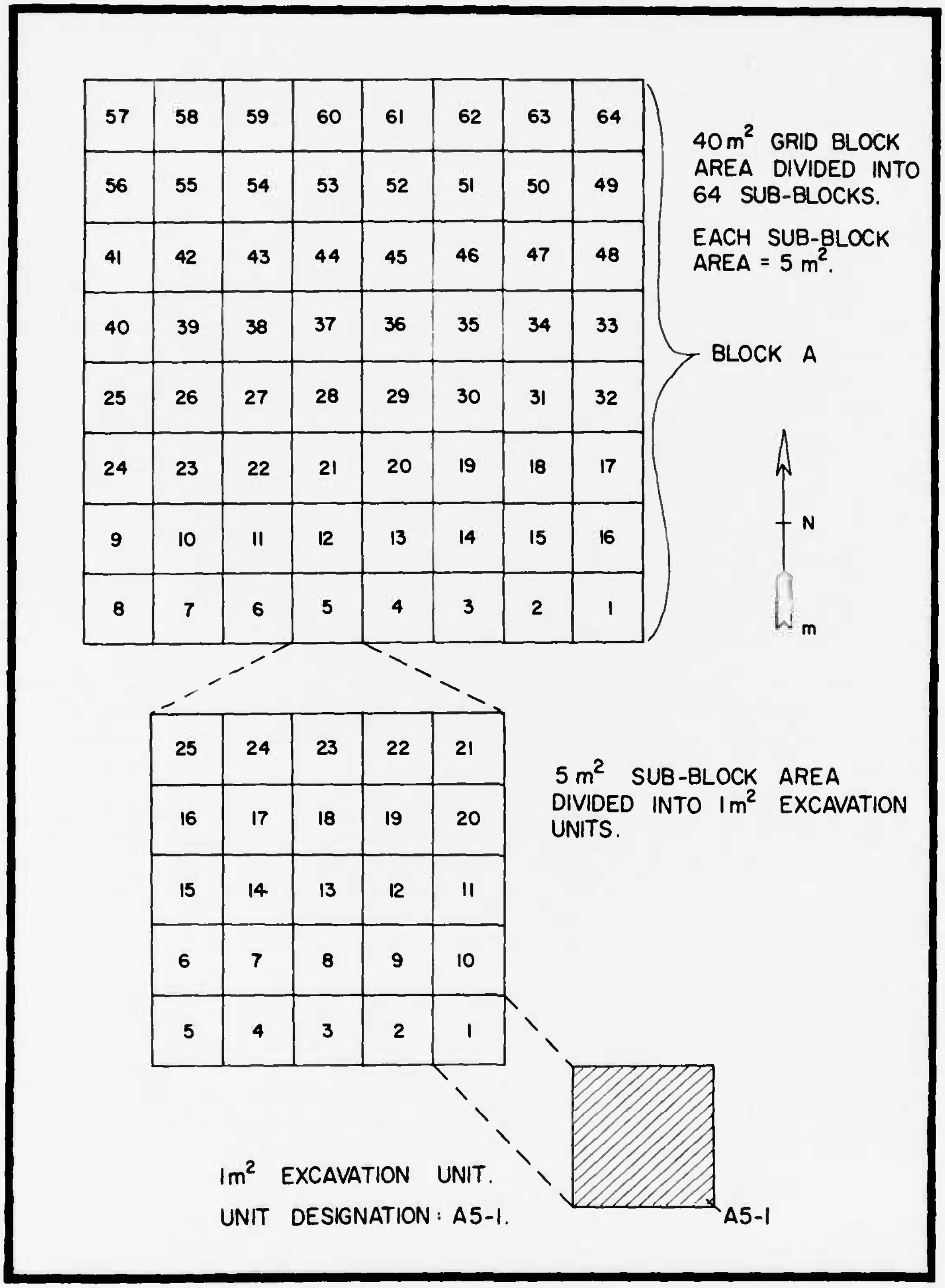


Fig. 7. Outline of random sample excavation design.

One potential problem, of this design, is that each site has been previously tested through the use of post holes, 1 m test squares, or both, and at some sites trees or tree stumps have disturbed the underlying deposits of the randomly selected squares. In these cases, non-probabilistic sampling involving the excavation of the nearest adjacent square to a particular disturbance will be utilized.

In addition to the 12 randomly chosen squares, one 1 m square will be selected (not necessarily at random) as a control square, and all sediments will be waterscreened through 1/16 inch mesh hardware cloth.

This kind of sampling model requires excavation of each randomly selected square to the limit of its cultural deposit but will not preclude the excavation of additional squares. This type of flexibility in the sampling strategy allows for the modification of excavation procedures to accomodate the investigation of cultural features or artifact concentrations as deemed necessary. Also, this procedure insures a better distribution of excavation units and avoids the grouping possible with traditional random sampling procedures.

Each excavation unit will be numbered according to its block designation, its placement within the sixty-four 25 m^2 sub-blocks, and its 1 m square location within the sub-block. Thus a designation such as A58-3 would mean that it is the third 1 m square found in the 58th sub-block of 40 m^2 block A.

All squares will be designated from the southeast corner, which will also serve as a reference for horizontal and vertical measurements. The horizontal coordinates of any artifact or feature located *in situ* will be measured using distances north and west of the south and east walls, and vertical measurements will be taken from the surface at the southeast corner of each square.

Excavations will proceed in a traditional manner, using hand tools (shovels, trowels, pick mattocks, etc.). Since natural strata are usually difficult to discern while excavating, they will not be used to seperate cultural components. Instead, each randomly selected square will be excavated in contoured arbitrary 10 cm levels (Fladmark 1978: 79). All sediments will be screened through ¼ inch hardware cloth. The control squares will be excavated in contoured 5 cm arbitrary levels, and sediments will be waterscreened through 1/16 inch hardware cloth. When cultural features are encountered an attempt will be made to define their horizontal limits prior to cross sectioning. Sediments from cultural features will be collected for flotation, soil analyses, and pollen analysis. The amount and size of each sample will depend on the particular nature of the feature. In addition, rocks will be collected from rock features for future angularity and lithological studies, and possible thermoluminescence dating.

The field identification and curation of artifacts and non-artifactual remains such as charcoal or baked clay will consist primarily of a code system. Code 1 artifacts refers to those specimens found *in situ*, Code 2 denotes items found within a quadrant and level of a square, Code 3 artifacts consist of specimens recovered during the screening process but can be identified to a particular level of a square, Code 4 refers to items found in a square but

not associated with a level (for the most part, these will consist of artifacts which may be displaced from the walls or balks of a square), and Code 5 refers to general surface finds at specific sites. All artifacts will be placed in individual plastic bags with an identifying tag in order to limit field and lab induced edge damage.

Topographic maps will be prepared for each site using a plane table and alidade. A permanent datum will be established at each site, and will consist of a stell rod placed in cement and buried. All vertical and horizontal measurements will be taken from the datum, and the southeast corner of each excavation unit will be mapped in relation to the datum. In addition, stratigraphic profiles will be drawn of the south and east walls of all squares. Profiles will also be taken from other portions of the excavation units when it is necessary. All features and artifacts will also be mapped and photographed. Finally, each site will be backfilled and restored as closely as possible to its original condition at the termination of excavations.

Laboratory Techniques

Laboratory analyses will be divided between a field laboratory and the permanent laboratory at the Archaeological Research and Management Center in Norman. The primary duties of the field laboratory will consist of washing, sorting, counting, and cataloging of the recovered artifacts. This provides immediate feedback to the field crews in terms of the quantity of cultural remains being recovered from a particular level.

CATALOG SYSTEM

The catalog system is fairly straightforward and is provided in Table 6. The system utilizes the Site number written over the Lot number (designating the square and level), a Category number (denoting bifaces, ground stone, ceramics, etc.), a Variety number (referring to a specific variation in form), and the Artifact number. The artifact number refers to the total consecutive number of artifacts found in a particular level beginning with the biface category (.1) and ending with the historic category (.10). The value of this system is that it allows an easy reference to the total number of artifacts recovered in a level, and it is additive since categories and varieties can be readily incorporated.

Additional cataloging, washing, sorting, and counting of the recovered materials will be conducted in the Norman laboratory. The sorting of water-screen materials, preparation of charcoal samples for radiocarbon dating, identification of lithic material types, measuring artifacts, and preparing materials for curation will also be completed in the Norman laboratory.

Table 6. Clayton Lake Archaeological Project (1978): Catalog System

I. Site Number: 34Pu-71, 34Lt-32, etc.

II. Lot Number: Example - Sq. B22-17, Level 1 (0-10 cm) = #41.

III. Categories

- .1 Biface
  - .1 Large contracting stemmed point
  - .2 Large expanding stemmed/corner-notched point
  - .3 Large straight/bulbous stemmed point
  - .4 Large side-notched point
  - .5 Large triangular point
  - .6 Small point (miscellaneous)
  - .7 Other (drills, wedges, tested cobbles, bifaces, preforms, cores, etc.)
- .2 Biface fragment
- .3 Uniface (unifaces, modified flakes, modified blocky debris)
- .4 Ground stone
  - .1 Mano
  - .2 Grinding/milling stones
  - .3 Ground/rubbed hematite and limonite
  - .4 Ground sandstone/slate (pipes, beads, celts, abraders, etc.)
- .5 Ground stone fragment
- .6 Pecked/battered/unmodified cobble
  - .1 Hammerstones
  - .2 Other (pecked/battered cobbles, unmodified cobbles, unmodified hematite/limonite)
- .7 Ceramics
  - .1 Pottery (sherds)
  - .2 Other (beads, whorls, figurines, modeled clay)
- .8 Worked bone
- .9 Worked shell
- .10 Historic material

IV. Artifact number (given to all categories except unifaces).

V. Count only: Flakes (including blocky debris).

WATERSCREEN SORTS

The sorting of waterscreened levels will be conducted in order to obtain floral, faunal, charcoal, and small lithic remains. Unfortunately, this process was extremely time consuming and the returns were minimal due to poor preservation. As a result, only 500 g units were sorted from the levels, and the number of levels was reduced to include one level for each major stratigraphic zone at each site. For example eleven 5 cm levels were excavated at 34Pu-105, but only 500 g from each of five levels were completely sorted in the laboratory.

LITHIC RESOURCE IDENTIFICATON

Identifying lithic resources at each site will provide data regarding the use of particular resources through time. It will also be important for determining if particular lithic resources are used for certain types of tools, and whether populations utilizing Jackfork Valley were obtaining lithic resources from nonlocal sources. As a result, lithic identifications will be made on all tool classes and artifacts at each site. The amount of lithic debitage, that is expected, precludes total identification of this class of material. Therefore, debitage from two randomly selected squares within every block at each site will be analyzed. These will either be the deepest squares or they will be squares that could provide the greatest amount of information. Prior to the initiation of this procedure, all of the debitage from 34Pu-72, 34Pu-105, and 34Pu-111 had been analyzed, and these results are presented in their respective chapters.

MEASUREMENTS

A limited series of interval measurements will be taken on each category of artifacts (Fig. 8). These will be presented for each site in summary form (range, mean, and standard deviation). Measurements will be determined either in millimeters or grams. Linear measurements will be taken with a vernier caliper and weights will be determined using a beam balance. Nominal measurements such as ceramic colors will be determined using soil color charts (Munsell Soil Color Charts 1975). A concentration index (CI) will be calculated for most of the site samples. These calculations, for the most part, involve dividing the total number of artifacts per level by the number of levels excavated in a square. Since each level and square at each site will be of uniform size, the calculations will not be multiplied by the volume.

Lithic Reduction Model

The lithic reduction model used in this phase of investigations is identical to that provided by Bobalik (1977: 31-44). Generally, the model

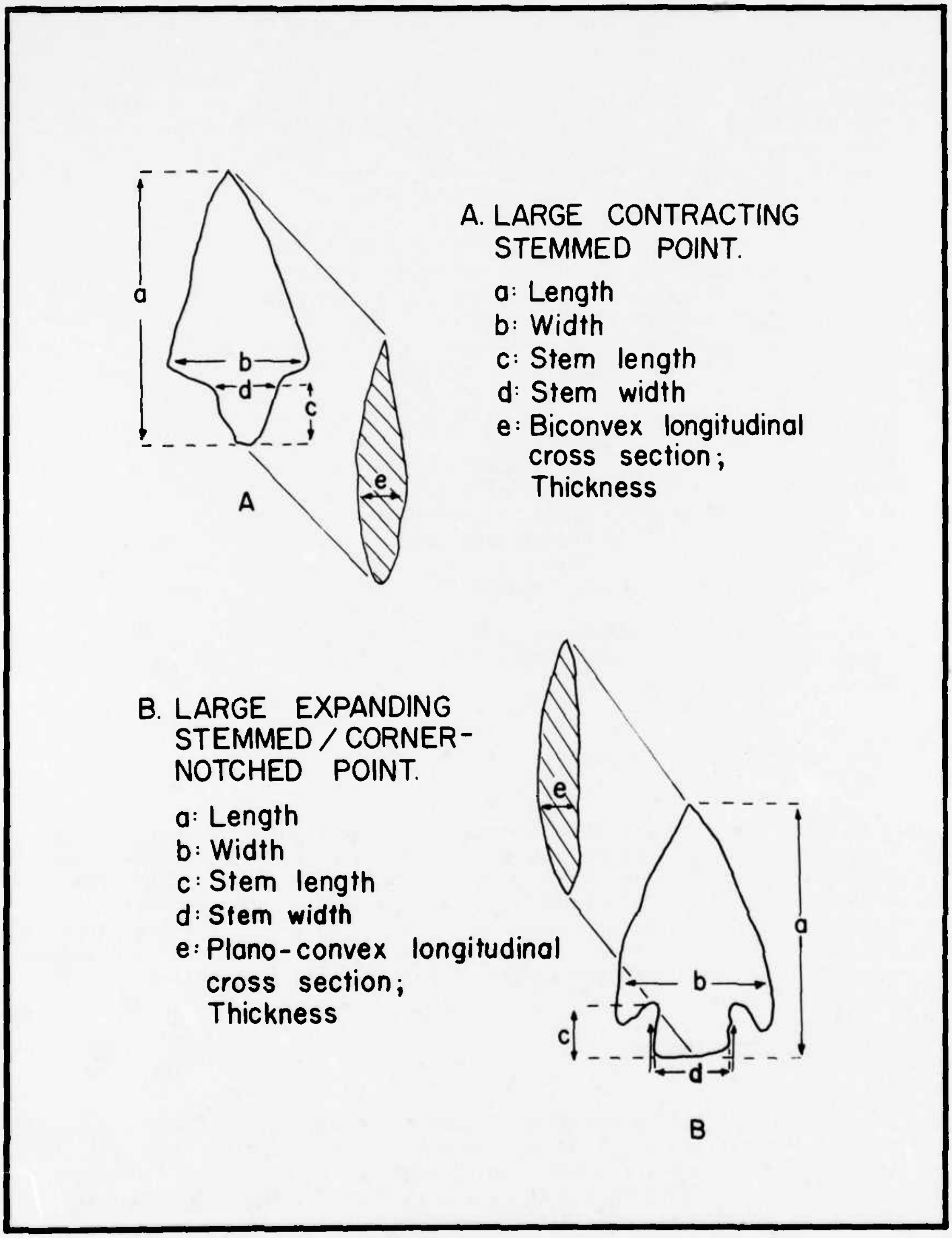


Fig. 8 . Projectile point measurements.

is concerned with "the procurement of raw materials, the selection and testing of the obtained materials, the bifacial reduction of those materials meeting cultural criteria, the use and maintenance of implements, and flake modification, use, and rejection" (Bobalik 1977: 31). It is also emphasized that specimens can be discarded at any point in the reduction sequence, thus becoming part of the archaeological record. A specimen may also be removed from the sequence for modification and use and then discarded or recycled back into the reduction system (Bobalik 1977: 31). The intended goal of this type of model is to provide information about the manufacture, use, recycling, and abandonment of lithic tools which will assist in developing and testing hypotheses involving functional variability within and between sites. The interested reader is referred to Bobalik (1977: 42-43) for a detailed discussion of these hypotheses. The basic assumption is that it is possible to discern base and special activity camps within a settlement system. The cultural assemblage associated with base camps should reflect activities related to nutritional and technological requirements of the group, and tools related to the exploitation of particular resources should be dominant at special activity sites. Essentially, a wider range of artifacts should be found at base camps in addition to all stages of lithic reduction, but with greater emphasis on manufacturing and maintenance of tools. At special activity sites more task specific tools should be common. For example, at a lithic procurement site we would expect that artifacts representing initial and primary modification stages of the lithic reduction model would be more common (Bobalik 1977: 42-43).

The primary modifications made in the original model involve strengthening the definitions used by Bobalik (1977; 1978). These are described in summary fashion below.

SPLIT COBBLE/PEBBLE SECTIONS

These specimens are a result of splitting cobbles or pebbles into large sections for further reduction, and are representative of procurement and initial modification activities. A minimal number of large flake scars may be present either unifacially or bifacially. These artifacts have thick, irregular cross sections and are not shaped. Cortex covers over 50% of the dorsal surface. The edges adjacent to the ventral surface are sinuous and there is no indication of haft element preparation.

TESTED COBBLES/PEBBLES

This represents a grouping of cobbles/pebbles exhibiting cortex over most of the surface and a minimal amount of flaking. The flake scars are large, few in number, and are usually restricted to one area. There is no indication of shaping and edges are sinuous. These specimens also represent procurement and initial modification activities.

COBBLE/QUARRIED BLOCK BIFACE I

These artifacts consist of pebbles, cobbles, or quarried nodules which have been selected for bifacial reduction, and probably are indicative of initial modification. The original shape of the parent material is retained since these specimens have thick, irregular cross sections, more than 50% cortex on one or both surfaces, and lack evidence of deliberate shaping. Flake scars are large, edges are sinuous, and there is no indication of a haft element.

COBBLE/BLOCK BIFACE II/THICK BIFACE

These artifacts represent primary modification activities and exhibit evidence of minor shaping. The edges, however, are still sinuous to slightly sinuous. They also have thick, irregular cross sections and large flake scars but they retain either small amounts (less than 50%) or no cortex. There is no evidence of a haft element.

THIN BIFACE I

These specimens are also part of the primary modification activity set, but they exhibit more modification than the previous group. They are characterized by somewhat uniformly thinned cross sections, some shaping, and predominantly small flake scars. The edges tend to be slightly sinuous and in some specimens they may be regular. There is no indication of a haft element.

THIN BIFACE IIa

These specimens are believed to be derived from the preceding group and represent a secondary modification activity set. These activities involve final bifacial thinning and edge trimming. Artifacts in this group appear to be deliberately shaped, have uniformly thinned cross sections, and exhibit less than 10% cortex or no cortex at all. There is no haft element, but the edges are regular and flake scars are small.

THIN BIFACE IIb

Artifacts in this group also represent secondary modification, but cortex is lacking and there is an indication of a haft element such as notching and constricting basal edges. Otherwise, they are similar to the previous group in attributes such as shaping, uniform thin cross sections, regular edges, and small flake scars.

COBBLE/BLOCK BIFACE III

Items in this group reflect an activity related to finished implements and maintenance. These specimens are defined primarily by their overall large size and are believed to result only from the bifacial reduction of cobbles/pebbles or quarried blocks. They display little (less than 50%) or no cortex. They also have regular edges, small flake scars, and a haft element may be present.

UNSTEMMED THIN BIFACES/POINTS

These are well-shaped artifacts which have thin, uniform cross sections, regular edges, no cortex, and do not have prepared haft elements. They also exhibit minute edge alteration or retouch scars.

STEMMED THIN BIFACES/POINTS

These artifacts are similar to the previous group in having thin uniform cross sections, regular edges with minute edge alteration flake scars, and no cortex. The only difference is that these items have a deliberately prepared haft element.

BIFACE/POINT FRAGMENTS AND SEGMENTS

This represents a residual grouping of specimens that are too fragmentary for inclusion within the other thin biface groups. They exhibit some pre-determined shaping, thin uniform cross sections, regular or slightly sinuous edges, and little or no cortex. In many instances it is not possible to determine if a haft element was present.

Artifact Descriptions

Artifact descriptions are provided for each site in Chapters 7-14. A classification similar to that devised for the Wister Project was used (Galm 1978a: 136-137). This system is based on size, morphology, and technology. It classifies artifacts on four levels, with each level receiving a number designation, and operates from the most general to the most particular. At the first level artifacts are placed into a general artifact class such as chipped stone *(01)*, ground stone *(03)*, worked bone *(05)*, historic debris *(07)*, and so forth. The next level relates the artifacts to a particular group (e.g., *01* - points, *02* - drills, *03* - wedges, and so forth). The third level places the artifact within a particular category and is denoted by the

final two-digit number which is followed by a letter designation indicating a variety of this category *(01A)*. The variety distinction is the fourth level and is the most particular since it indicates specific variation based on attributes such as size, notching, stem configuration, and blade form (Galm 1978a: 136). For example, a classification number such as *01-02-01A* would mean that we are classifying a chipped stone artifact *(01)*, which is considered to be a drill *(02)*, and which has an expanding base *(01A)*.

The use of the various biface groups also requires some clarification. The major group of bifaces *(01-10-00)* relates to specimens in the lithic reduction model. These items do not exhibit evidence of wear. On the other hand, miscellaneous biface implements *(01-11-00)* are specimens which have been removed from the reduction continuum and have been used as tools. Both tanged bifaces *(01-08-00)* and backed bifaces *(01-09-00)* are tools which can not be placed into the reduction continuum, but are complete. Also, the point categories *(01-01-00)* fall into the lithic reduction sequence as stemmed and unstemmed thin bifaces.

A primary reason for employing this classification system is that it will facilitate the computerization of collections at the Archaeological Research and Management Center. A summary of the artifact classes and groups from the Phase I investigations at Clayton Lake appears in Table 7.

In summary, the research designs followed during Phase I investigations will be oriented toward the collection of data relating to settlement-subsistence patterns in the project area with special emphasis placed on site chronology, occupation, and function. In addition, the materials will be classified in such a way as to make them amenable for computerization in the future. All field maps, notes, materials, and quantitative data will be on file at the Archaeological Research and Management Center at the University of Oklahoma.

Table 7. Summary of artifact classes and groups from the Phase I investigations at the proposed Clayton Lake.

Chipped Stone *(01)*

POINTS (01-01-00)
DRILLS (01-02-00)
WEDGES (01-03-00)
BURINS (01-04-00)
SCRAPERS (01-05-00)
DOUBLE-BITTED AXES (01-06-00)
HOES (01-07-00)
TANGED BIFACES (01-08-00)
BACKED BIFACES (01-09-00)
BIFACES (01-10-00)
MISCELLANEOUS BIFACE IMPLEMENTS (01-11-00)
POINTS/BIFACE FRAGMENTS AND SEGMENTS (01-12-00)
MODIFIED FLAKES (01-13-00)
CORES (01-14-00)
SPLIT/TESTED COBBLES (01-15-00)
DEBITAGE (01-16-00)

Fired Clay *(02)*

CERAMICS (02-01-00)
CERAMIC PIPES (02-02-00)
BAKED CLAY (02-03-00)

Ground Stone *(03)*

MANOS (03-01-00)
METATES/GRINDING SLABS (03-02-00)
ABRADERS (03-03-00)
GROUND HEMATITE (03-04-00)
GORGETS (03-05-00)
MISCELLANEOUS GROUND STONE IMPLEMENTS (03-06-00)

Table 7. Continued

Pecked/Battered/Unmodified Cobble *(04)*

HAMMERSTONES (04-01-00)
PITTED STONES (04-02-00)
MISCELLANEOUS PECKED/BATTERED STONES (04-03-00)
UNMODIFIED COBBLES/PEBBLES (04-04-00)

Worked Bone *(05)*

Worked Shell *(06)*

Historic Debris *(07)*

GLASS (07-01-00)
CROCKERY/CERAMICS (07-02-00)
METAL (07-03-00)
PLASTIC (07-04-00)

Faunal *(08)*

BONE/HORN/TEETH (08-01-00)
SHELL (08-02-00)

Floral *(09)*

NUTS/SEEDS/CHARCOAL

CHAPTER 7

THE LEE KIRKES SITE (34Lt-32)

Sheila J. Bobalik

INTRODUCTION

This site is on a prominent terrace overlooking Anderson Creek which is approximately 125 m east and 350 m northeast of the site (Fig. 2). The site has an elevation of 600 feet (183 m), and will be submerged at maximum flood pool level. A proposed road relocation and construction of Yanush Landing may also disturb the site (Corps of Engineers 1977: 7-4; Figures BE 350-DM20-93/2 and 93/9).

Currently, the lower portion of the terrace is covered with vines, waist high briars, and oak seedlings, while the upper portion is covered with a secondary growth of scrub oak and locust trees. Erosion of the lower terrace margins is apparent, and an old vehicle path cuts across the western part of the site. In addition, surface scatters of stream cobbles and sandstone rocks are evident across portions of the site, and probably reflect historic plowing. One landowner indicated that rocks were deposited on certain areas of the terrace to facilitate plowing, and that the southern portion of the site is covered with water when Anderson Creek overflows.

PREVIOUS INVESTIGATIONS

This site was recorded in 1972 at which time lithic debris was collected (Neal 1972: 31). Preliminary testing of the site was conducted in 1976 and involved the excavation of 27 post hole tests and five 1 m test squares which were excavated in 10 cm arbitrary levels. These squares were excavated in order to verify post hole data regarding vertical and horizontal distributions, quantity and variety of cultural materials, and the presence of cultural features.

Based on this limited testing the site appeared to cover an area approximately 130 m by 100 m (Bobalik 1977: 391). High concentrations of material were observed in post holes and squares located on the central and upper portions of the terrace (Bobalik 1977: 400-406). They indicated that cultural debris occurred as deep as 75-100 cm below ground surface. A rock feature of unknown function was excavated at a depth of 33-40 cm in Test Square 1 (Bobalik 1977: 400).

These data suggest that at least two components are present at 34Lt-32 (Bobalik 1977: 431). The upper 30 cm of the deposits are believed to represent a Woodland and/or early Caddoan occupation. Artifacts recovered from these levels include shell and grog tempered ceramics, a double-bitted ax and a possible chipped stone hoe, ground stone, small points (*Scallorn*) large contracting stemmed points (*Gary*), and some large expanding stemmed points (Bobalik 1977: 435). No pottery or small points occur in the lower levels (5-7), but *Frio*-like points and large straight stemmed specimens are predominant in these levels. The latter point styles are usually associated with the Archaic period.

It is believed that the site was used repeatedly as a long- or short-term base camp (Bobalik 1977: 435). Suggested activities include hunting, vegetal procurement, processing, storage, and lithic reduction (especially later stages of the sequence and tool maintenance).

Additional investigations were recommended at 34Lt-32 because of the limited extent of the testing program, adverse impact of the proposed lake construction, and the potential for information regarding Archaic, Woodland, and Caddoan occupations.

EXCAVATION STRATEGIES

A random sample excavation design outlined in Chapter 6 was employed. Four contiguous 40 m^2 blocks (A-D) forming an 80 m by 80 m square area oriented to magnetic north were superimposed over the major portion of the site (Fig. 9). Forty-eight 1 m squares were randomly selected for excavation, and a permanent datum was established at the center of the four contiguous blocks. Prior to excavation, the site was cleared mechanically of its dense overgrowth of vegetation.

Excavations in 10 cm arbitrary levels were started in Units B1-1, 17-22, 32-22, 63-12, and D2-14 and 4-13. The matrix from each level was screened through ¼-inch hardware cloth. However, excavations were abruptly terminated at the landowner's request since the Corps of Engineers had not formally purchased this property, and all squares were back filled. As a result, portions of only six squares (40 levels) were excavated, and only 35 ten centimeter levels were completely excavated. Only one square (B17-22) was excavated to sterile soil, and no water-screening was conducted. A detailed contour map could not be made, and as a result the 40 m^2 block areas were superimposed on the 1976 contour map for the purposes of this report.

STRATIGRAPHY

Few stratigraphic profiles were accurately drawn and described during the abbreviated field season at 34Lt-32. A single stratigraphic sequence

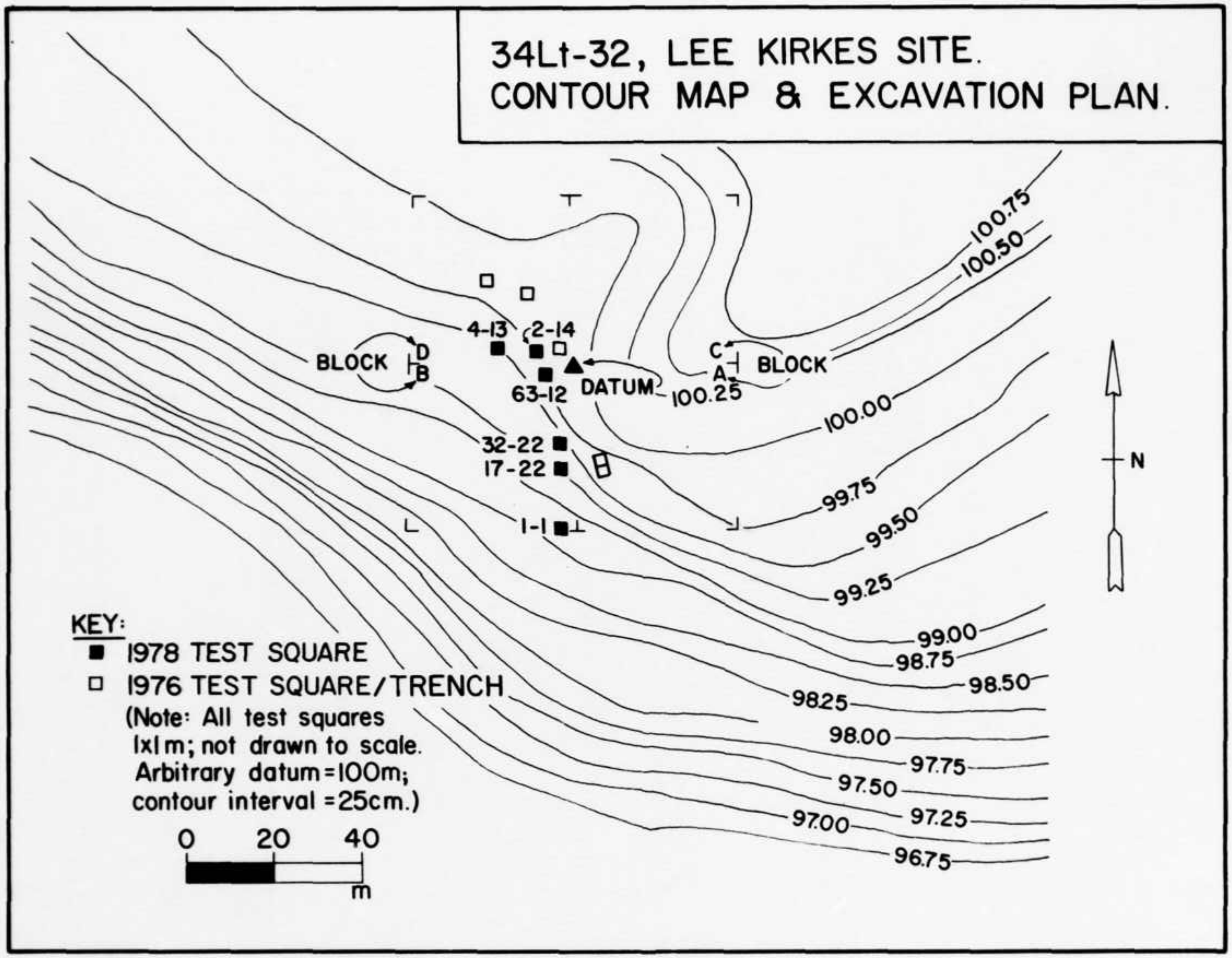


Fig. 9. Contour map and excavation plan of the Lee Kirkes site (34Lt-32).

from B63-12 is described below (Fig. 10). Colors are taken from moist samples.

Stratum I

This very dark brown (10YR 2/2) zone of sandy loam is restricted to the upper 20 cm, contains numerous roots and rootlets, and is believed to represent the plowzone. Small to very small, well sorted gravels are occasionally present, and cultural materials are abundant.

Stratum II

This stratum is composed of dark brown (7.5YR 3/4) sandy loam. It ranges from 20 cm to 38 cm below ground surface. Occasional rootlets and bioturbation in the form of burrowing animals, insects, and roots was observed. Well sorted gravels similar in size and number to Stratum I are also present. Cultural materials are abundant.

Stratum III

This stratum is a brown/dark brown (7.5YR 4/4) zone of fine loamy sand with few rootlets extending from 38 cm to 58 cm below ground surface. Well sorted gravels are present, but are smaller than those observed in Strata I and II. Disturbance from rodents and roots was observed. Cultural materials are present.

Stratum IV

This stratum is composed of a strong brown (7.5YR 4/6) fine sandy loam, and ranges from 58 cm to 74 cm below ground surface. Very few rootlets are present. The well sorted gravels are similar in size to those observed in Stratum III, but are more numerous. Cultural materials are present although in reduced quantities.

Stratum V

This stratum is a strong brown (7.5YR 5/8) fine loamy sand with the upper boundary occurring at a depth of 74 cm and continuing to at least a depth of 94 cm. The well sorted gravels are small to very small and more numerous than in the other strata. Cultural materials are sparse.

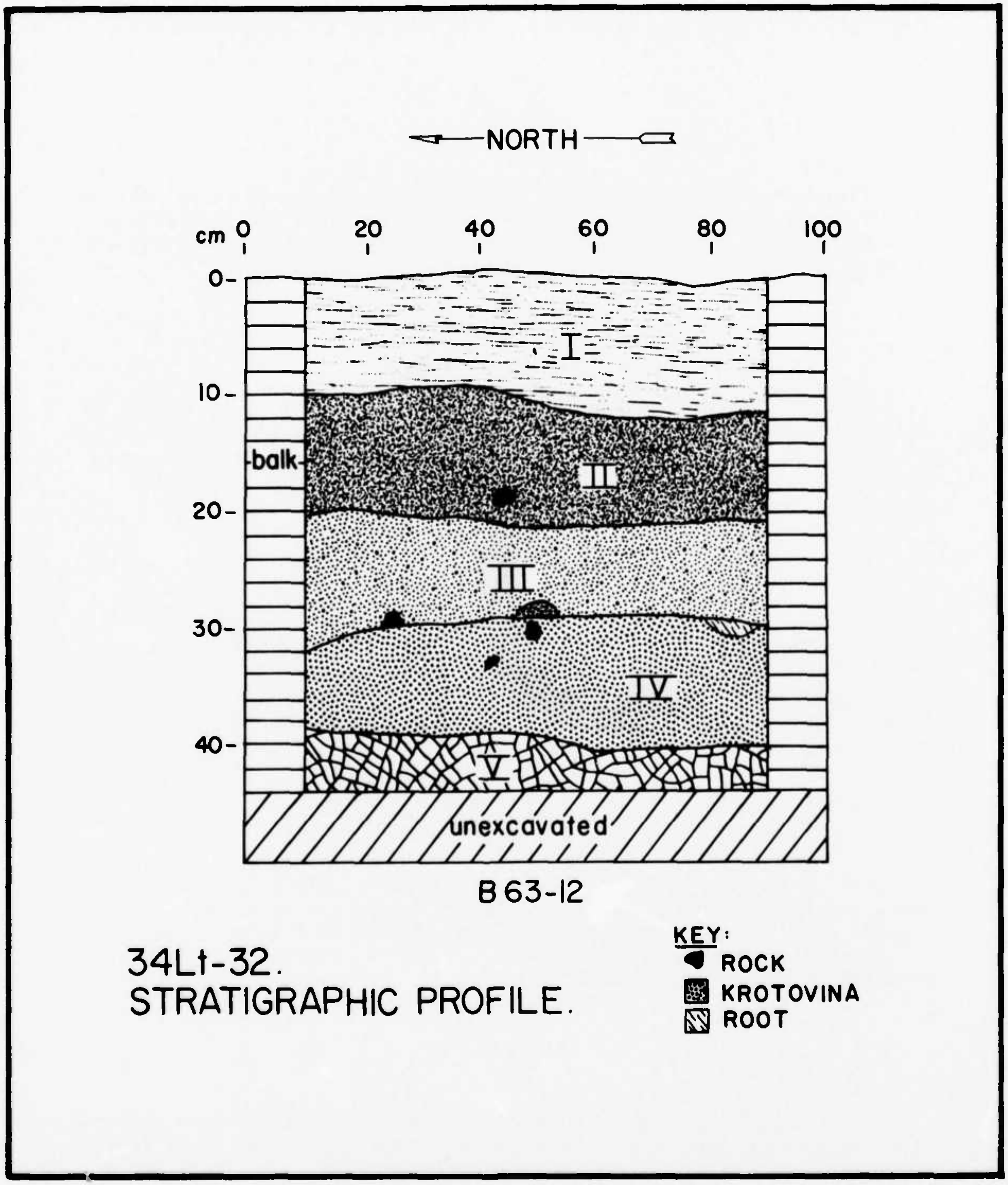


Fig. 10. Stratigraphic profile of east wall of B63-12 at the Lee Kirkes site (34Lt-32).

FEATURES

Feature numbers were assigned to four rock concentrations in different squares. Their horizontal extent could not be determined since they continued into adjacent squares.

Rock Concentrations

Feature 78-1 (Fig. 11a)

This feature is located in Block D. It is composed of 30 well sorted sandstone rocks, occurring 22-33 cm below ground surface. It corresponds to the bottom of Stratum II with occasional rocks extending into the top of Stratum III in D4-13. The rocks are angular, 5-12 cm in diameter. One rock characterized by a red and black color, numerous cracks, and occasional spalling may be thermally altered even though there are no other indications of burning, such as charcoal or matrix discoloration. Associated artifacts include two point varieties *(01-01-01A* and *01-01-02H)* and a single hammerstone *(04-01-01A)*.

Feature 78-2 (Fig. 11b)

This feature consists of a well sorted scatter of 11 sandstone rocks between 53-70 cm below ground surface. It is concentrated in the northern portion of B63-12. The concentration is primarily at the top of Stratum IV although rocks also occurred at the bottom of Stratum III. The rocks are large (20-25 cm), unbroken, and well rounded. There is no indication of thermal alteration or burning. Two thick bifaces *(01-10-02A)* are associated with the feature.

Feature 78-3 (Fig. 11c)

A scatter of 15 to 20 well sorted sandstone rocks, observed in B32-22 at a depth of 27-40 cm, make up this feature. It is in Stratum III although rocks were also present in the bottom of Stratum II. The rocks are angular and range between 10-20 cm in size. There is no evidence of burning, and no artifacts are directly associated with the feature.

Feature 78-4 (Fig. 11d)

This feature contains approximately 40 sandstone rocks between 18-30 cm below ground surface in B17-22. It is primarily in Stratum III although some rocks are also in the bottom of Stratum II. Most are rounded or angular and are less than 15 cm in size. One large slab (20 cm wide, 14 cm thick) protrudes diagonally about 40 cm from the southeast corner. None of the

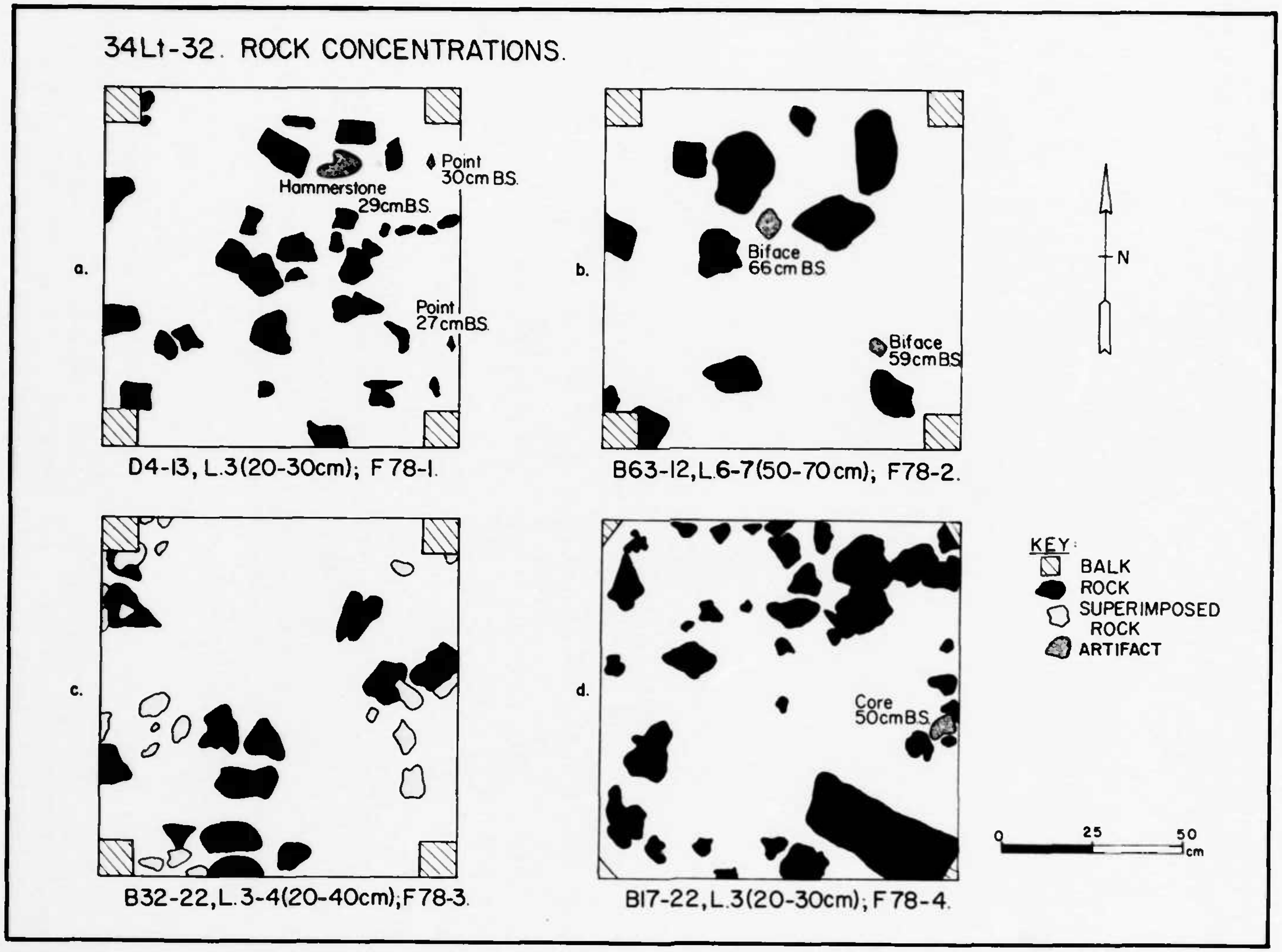


Fig. 11. Plan view of features from the Lee Kirkes site (34Lt-32).

a: F78-1 c: F78-3
b: F78-2 d: F78-4

rocks appear thermally altered. One core *(01-14-01A)* is associated with the feature.

In summary, Features 78-3 and 78-4 are separated by only 4 m, and may represent a single rock concentration. Both have similar stratigraphic positions, primarily in Stratum III, but also at the base of Stratum II. Differences in depth are believed to be related to geological rather than cultural processes. The function of these rock concentrations is unknown, but they may represent secondary cultural depositions.

CULTURAL REMAINS

Descriptions of the various artifact categories is presented below. Table 8 provides a summary of artifact categories and varieties from the site. Metric data are provided in Tables 10 and 13, and material type data are in Table 11.

Chipped Stone *(01)*

POINTS (01-00)

Large Contracting Stemmed Points *(01-01-01)*

01-01-01A N=14: 1 Complete, 13 Fragmentary (Fig. 12 a-b)

These specimens are chacterized by triangular blades and slight to pronounced contracting stems. Maximum width is at the shoulders which range from quite pronounced to weakly defined. Seven percent of the cross sections are plano-convex and 93% are biconvex. Of the three more complete specimens, one distal end is acute and two are slightly rounded due to reworking. Impact fractures occur at the distal end of two artifacts. Blade edges are straight to slightly convex, but two are slightly concave. Eight bases are convex, one is straight, and two are pointed. Many specimens have been extensively reworked, particularly at the shoulders.

Comments: These specimens are similar to *Gary* points.

References: Bell 1958: 28, Pl. 14; Suhm and Jelks 1962: 197, Pl. 99.

Large Expanding Stemmed/Corner-Notched Points *(01-01-02)*

01-01-02G N=1: 1 Fragmentary (Fig. 12 c)

This specimen has a triangular blade with convex edges and a biconvex cross section. Maximum width occurs at the shoulders which are pronounced and barbed. The expanding stem is the result of large, broad corner notches. The base ranges from straight to slightly concave, and has rounded corners.

Table 8. Summary of artifact categories and varieties from 34Lt-32.

Chipped Stone *(01)*

POINTS (01-00)
- Large Contracting Stemmed Points *(01-01)*
  - *01-01A*
- Large Expanding Stemmed/Corner-Notched Points *(01-02)*
  - *01-02G*
  - *01-02H*
  - *01-02P*
- Small Expanding Stemmed/Corner-Notched Points *(01-06)*
  - *01-06A*
  - *01-06C*
- Small Expanding Stemmed/Side-Notched Points *(01-07)*
  - *01-07F*

WEDGES (03-00)
- *03-01A*

BIFACES (10-00)
- Cobble/Quarried Block Biface I *(10-01)*
  - *10-01A*
- Cobble/Block Biface II/Thick Biface *(10-02)*
  - *10-02A*
- Thin Biface I *(10-03)*
  - *10-03A*
- Thin Biface IIa *(10-04)*
  - *10-04A*
- Thin Biface IIb *(10-05)*
  - *10-05A*

MISCELLANEOUS BIFACE IMPLEMENTS (11-00)
- Thick Biface Tool *(11-02)*
  - *11-02A*
- Thin Biface Tool *(11-03)*
  - *11-03A*
- Tested Pebble/Cobble Tool *(11-09)*
  - *11-09A*

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)
- *12-01A*

MODIFIED FLAKES (13-00)
- *13-01B*

CORES (14-00)
- *14-01A*

SPLIT/TESTED COBBLES (15-00)
- Split Cobbles *(15-00)*
  - *15-01A*
- Tested Cobbles *(15-02)*
  - *15-02A*

Table 8. Continued

DEBITAGE (16-00)
16-01A
16-01B

Fired Clay *(02)*

CERAMICS (01-00)
Plain Grog, Grit, and Bone Tempered Wares *(01-01)*
01-01A
01-01C
Plain Shell Tempered Wares *(01-03)*
01-03A

BAKED CLAY (03-00)
Baked Clay *(03-01)*
03-01A

Ground Stone *(03)*

MANOS (01-00)
Unifacial Manos *(01-01)*
01-01A
Bifacial Manos *(01-02)*
01-02A
Faceted Manos *(01-03)*
01-03A

GROUND/RUBBED HEMATITE (04-00)
04-01A

Pecked/Battered/Unmodified Cobbles *(04)*

HAMMERSTONE (01-00)
01-01A

PITTED STONES (02-00)
Bifacial Pitted Stones *(02-02)*
02-02A

UNMODIFIED COBBLES/PEBBLES (04-00)
Fossils *(04-02)*
04-02A

Historic Debris *(07)*

GLASS (01-00)
01-01A

Faunal *(08)*

BONE/HORN/TEETH (01-00)
01-01A

Table 8. Continued

SHELL (02-00)
Molluscs *(02-01)*
02-01A
Gastropods *(02-02)*
02-02A
Floral *(09)*

The stem is well defined with straight, expanding edges. The distal tip and shoulders are broken, but the blade appears to be reworked.

Comments: Although this item is similar to many expanding stemmed forms, it most closely resembles the *Summerfield* type.

References: Galm and Flynn 1978: 167-168, Fig. 36h and i.

01-01-02H N=3: 3 Fragmentary (Fig. 12 d-e)

These artifacts have triangular blades with convex to straight edges and biconvex cross sections. Maximum width occurs at the pronounced, barbed shoulders. The distinctly expanding stems are the result of deep, narrow corner notches. One specimen has an acute tip while the other two display impact fractures. Bases are straight to slightly concave, and basal corners are rounded to pointed. These artifacts have been reworked.

Comments: Specimens in this variety are similar to the *Marcos* type.

References: Bell 1958: 42, Pl. 21; Suhm and Jelks 1962: 209, Pl. 105.

01-01-02P N=1: 1 Fragmentary (Fig. 12 f)

This specimen has a long triangular blade with straight edges. Maximum width is at the shoulders although they are weakly defined. The stem is slightly expanding due to broad, shallow notches. It has a straight base which is nearly as wide as the shoulders and has been bifacially thinned. The only complete basal corner is pointed. Blade edges are reworked so that they appear alternately beveled, and result in a rhomboid-shaped cross section.

Comments: This specimen is similar to the *Travis* point type.

References: Bell 1958: 94, Pl. 47.

Small Expanding Stemmed/Corner-Notched Points *(01-01-06)*

01-01-06A N=3: 3 Fragmentary (Fig. 12 g-h)

These specimens have triangular blades with straight edges. Maximum width is at the shoulders which are pronounced and slightly barbed. Deep, narrow corner notches result in an expanding stem. Two bases are straight to slightly concave, and have acute to slightly rounded basal corners. An impact fracture occurs on the tip of one specimen. Two items are bifacially flaked and are biconvex in cross section. The other specimen is unifacially flaked but the opposite side has minimal edge modification and the original ventral surface of the flake is present. This specimen is plano-convex in cross section.

Comments: These points are similar to the *Scallorn* type.

References: Bell 1960: 84, Pl. 42; Suhm and Jelks 1962: 285, Pl. 143; Brown 1976: 81-82, Fig. 17.

01-01-06C N=1: 1 Complete (Fig. 12 i)

This specimen has a triangular blade, an acute distal end and a plano-convex cross section. One edge is straight while the other is slightly concave. Maximum width occurs at the barbed shoulders. The expanding stem is the result of deep, narrow corner notches. The base is straight and the basal corners are rounded. The ventral flake surface is unaltered except for minimal edge modification.

Comments: This item resembles *Agee* points.

References: Perino 1968: 4, Pl. 2; Brown 1976: 73, Fig. 14.

Small Expanding Stemmed/Side-Notched Points *(01-01-07)*

01-01-07F N=1: 1 Fragmentary

This basal fragment displays shallow side notches, and has a straight base. The complete basal corner is slightly rounded. This item is biconvex in cross section. Notches appear relatively low on the stem.

Comments: Due to its fragmentary nature, this specimen could not be related to a type. However, it resembles *Reed* and *Washita* points.

References: Bell 1958: 76, Pl. 38 and 98, Pl. 49; Brown 1976: 104, Fig. 19 and 105-108, Fig. 20.

WEDGES (03-00)

01-03-01A N=1: 1 Fragmentary (Fig. 12 j)

This specimen is bifacially flaked and biconvex in cross section. Bifacial alteration is present along one edge, but the opposite edge is broken and exhibits crushing and tiny flake scars which are believed to represent striking damage.

BIFACES (10-00)

Cobble/Quarried Block Biface I *(01-10-01)*

01-10-01A N=2: 2 Complete (Fig. 13 c)

Both items reflect the shape of the original parent specimen. They

have thick irregular cross sections, sinuous edges, and large flake scars. Stream cortex is observed bifacially and covers at least 50% of one surface. Hinge and step fractures are numerous.

Cobble/Block Biface II/Thick Biface *(01-10-02)*

01-10-02A N=47: 17 Complete, 30 Fragmentary (Fig. 13 d)

These minimally modified specimens exhibit large, bifacial flake scars and have thick, irregular cross sections. Cortex remains on 88% of the artifacts. A flake origin is indicated for 28% of the specimens. Platform preparation is occasionally observed. Sixteen (94%) of the complete specimens have numerous step and hinge fractures, while one (6%) appears to be thermally altered. Hinge and step fractures occur on 52% of the broken specimens and 7% may be thermally altered.

Thin Biface I *(01-10-03)*

01-10-03A N=20: 2 Complete, 18 Fragmentary (Fig. 12 n)

These items are irregularly thinned and have cross sections which vary from plano-convex (55%) to biconvex (45%). Cortex occurs on 10% of the sample. Edges are slightly sinuous (45%) or regular (55%). These specimens are roughly subrectangular, triangular, or ovoid in outline, and appear to be shaped. Platform preparation is present on some specimens, and 15% of the sample appears to be made from flakes. Both complete specimens have hinge and step fractures. Thermal alteration occurs on 11% of the broken specimens. Hinge and step fractures occur on 33% of the broken specimens, of which 17% are thermally altered.

Thin Biface IIa *(01-10-04)*

01-10-04A N=16: 2 Complete, 14 Fragmentary (Fig. 12 p)

These well shaped artifacts have small flake scars, lack cortex, and are uniformally thinned. Cross sections are plano-convex (12%) and biconvex (88%). The edges are regular and range from convex to straight. Shapes include: triangular, ovate, subrectangular, and semicircular. Origin could not be determined due to extensive bifacial modifications. One complete item has been reworked and has hinge and step fractures. Twenty-nine percent of the broken specimens have hinge and step fractures, and 7% appear to be thermally altered.

Thin Biface IIb *(01-10-05)*

01-10-05A N=2: 2 Fragmentary (Fig. 12 q)

These artifacts are similar to the preceeding category except for

indications of slightly contracting haft areas. A single shoulder area is weakly defined on each item.

MISCELLANEOUS BIFACE IMPLEMENTS (11-00)

Thick Biface Tool *(01-11-02)*

01-11-02A N=4: 1 Complete, 3 Fragmentary (Fig. 13 g)

These artifacts exhibit evidence of use in the form of tiny flake scars, edge rounding, and polish in one instance. The complete specimen is characterized by bifacial wear along one convex edge, and appears to be resharpened. Two artifacts have unifacial wear along convex edges, and one has unifacial wear along a broken convex edge.

Thin Biface I Tool *(01-11-03)*

01-11-03A N=3: 1 Complete, 2 Fragmentary (Fig. 12 o)

These specimens exhibit tiny flake scars which parallel one edge and rounded flake scar ridges adjacent to the edge. These modifications are suggestive of wear. Two specimens have biconvex cross sections and the other is plano-convex. Two items exhibit wear unifacially along the straight portion of one edge. The last artifact is subtriangular in shape with a convex bit end. This regular edge has been thinned and wear occurs bifacially.

Tested Pebble/Cobble Tool *(01-11-09)*

01-11-09A N=2: 2 Complete (Fig. 13 a)

These items display tiny flake scars which unifacially parallel one convex edge. The edge of one item also has heavy edge rounding. Both display numerous step and hinge fractures.

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)

01-12-01A N=30 (Fig. 12 k-m)

These are unclassified proximal, distal, or midsections which may represent points *(01-01-00)*, thin biface I *(01-10-03A)*, thin biface IIa *(01-10-04A)*, or thin biface IIb *(01-10-05A)* fragments. Cross sections are biconvex, plano-convex, or rhomboid. Twenty percent are proximal fragments. One of these is believed to be a large point fragment since the complete edge is deeply concave.

Distal fragments comprise 50% of the sample. Twenty-three percent have acute tips and are believed to be small point fragments. The remainder have round tips and could not be placed within the biface categories.

Thirty percent are midsections. Two may represent large point segments. One long, slightly contracting midsection is reworked along one edge dorsally and the opposite edge ventrally. As a result, this specimen appears beveled. Another specimen has minute flake scars and heavy edge rounding along one edge.

MODIFIED FLAKES (13-00)

01-13-01B N=146 (Table 9)

These flakes exhibit evidence of use in the form of tiny flake scars or edge rounding generally along the dorsal surface of a lateral edge. Type A is the dominant lithic type.

CORES (14-00)

01-14-01A N=1: 1 Complete (Fig. 13 b)

This specimen is characterized by the systematic removal of flakes from only one direction. Numerous hinge and step fractures are present. A portion of one edge is rounded and crushed. Numerous hinge and step fractures paralleling another edge are unifacially observed on the flat surface, and may reflect either platform preparation or wear.

SPLIT/TESTED COBBLES (15-00)

Split Cobbles *(01-15-01)*

01-15-01A N=3: 2 Complete, 1 Fragmentary (Fig. 13 f)

These unshaped sections are the result of splitting cobbles. All have large flake scars, thick irregular cross sections, cortex over more than 50% of the dorsal surface, and display step and hinge fractures.

Tested Cobbles *(01-15-02)*

01-15-02A N=6: 6 Complete (Fig. 12 r)

Flake scars on these specimens are relatively large. Considerable cortex is present probably due to minimal flaking. Step and hinge fractures are observed on 50% of the specimens, and one is heavily flawed.

Table 9. Summary of modified flake data from 34Lt-32.

Level	Modified Edge					Area of Edge Modification					Direction of Flake Removal			Contour of Modified Edge			
	Prox.	Lat.	Bilat.	Dist.	Mult.	Med.	Prox.	Dist.	Entire	Mult.	Vent.	Dors.	Comb.	Str.	Concave	Convex	Comb.
1 (0-10 cm)																	
Level Total N=25	2	11	3	4	5	3		5	8	9	1	19	5	8	3	5	9
Level Percentages	8	44	12	16	20	12		20	32	36	4	76	20	32	12	20	76
2 (10-20 cm)																	
Level Total N=35		15	2	6	12	5	3	8	10	9	7	22	6	3	8	9	15
Level Percentages		43	6	17	34	14	8	23	29	26	2	62	17	8	23	26	43
3 (20-30 cm)																	
Level Total N=24	1	10	6	3	4	4	4	3	6	7	4	15	5	6	3	7	8
Level Percentages	4	42	25	12	17	17	17	12	25	29	17	62	21	25	12	29	33
4 (30-40 cm)																	
Level Total N=10	1	5	3	1		4	1	1	3	1	1	9			4	4	2
Level Percentages	10	50	30	10		40	10	10	30	10	10	90			40	40	20
5 (40-50 cm)																	
Level Total N=16		10	1	2	3	3	2	4	6	1	4	10	2	2	4	6	4
Level Percentages		63	6	12	19	19	12	25	38	6	25	63	12	12	25	38	25
6 (50-60 cm)																	
Level Total N=12		6	1	3	2	2	2	3	4	1	4	6	2	3	2	4	3
Level Percentages		50	8	25	17	17	17	25	33	8	33	50	17	25	17	33	25
7 (60-70 cm)																	
Level Total N=3	1	1			1			1	1	1	1	2		2		1	
Level Percentages	33	33			33			33	33	33	33	67		67		33	
8 (70-80 cm)																	
Level Total N=6		4		1	1	2		1	3			5	1	1	3	1	1
Level Percentages		67		17	17	33		17	50			83	17	17	50	17	17
9 (80-90 cm)																	
Level Total N=5		1	1	2	1	1		1	2	1	1	3	1	2	1		2
Level Percentages		20	20	40	20	20		20	40	20	20	60	20	40	20		40
Code 4																	
Code 4 Total N=10		5		2	3	3	1	2	2	2	2	6	2	1	1	6	2
Code 4 Percentages		50		20	30	30	10	20	20	20	20	60	20	10	10	60	20
Sample Total N=146	5	68	17	24	32	27	13	29	45	32	25	97	24	28	29	43	46
Sample Percentages	3	47	12	16	22	18	9	20	31	22	17	66	17	19	19	30	32

Prox. = Proximal
Lat. = Lateral
Bilat. = Bilateral
Dist. = Distal
Mult. = Multiple

Med. = Medial
Vent. = Ventral
Dors. = Dorsal
Comb. = Combination
Str. = Straight

Table 10. Metric attributes for selected chipped stone varieties from 34Lt-32.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-01A					
$\bar{x}$	42.6	30.2	7.5	14.3	6.7
s.d.	1.0	8.9	2.1	2.6	1.5
range	41.6-43.5	18.6-42.0	5.3-12.9	10.3-17.1	4.0-8.8
N	2	8	14	11	12
01-01-02G					
$\bar{x}$	-	-	4.9	9.2	17.1
N	-	-	1	1	1
01-01-02H					
$\bar{x}$	50.4	-	6.0	8.2	20.4
s.d.	-	-	1.0	1.2	3.1
range	-	-	4.7-7.2	6.8-9.7	17.1-24.5
N	1	-	3	3	3
01-01-02P					
$\bar{x}$	-	22.2	7.2	12.6	-
N	-	1	1	1	-
01-01-06A					
$\bar{x}$	-	18.3	3.6	6.3	12.7
s.d.	-	-	1.1	1.1	0.3
range	-	-	2.5-5.2	5.1-7.8	12.5-13.1
N	-	1	3	3	3
01-01-06C					
$\bar{x}$	22.2	13.0	3.1	3.8	8.7
N	1	1	1	1	1
01-01-07F					
$\bar{x}$	-	-	3.1	-	-
N	-	-	1	-	-
01-03-01A					
$\bar{x}$	-	-	7.5	-	-
N	-	-	1	-	-

Table 10. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-10-01A					
x̄	50.5	40.5	20.1	-	-
s.d.	5.9	0.6	5.5	-	-
range	44.6-56.4	39.9-41.0	14.6-25.5	-	-
N	2	2	2	-	-
01-10-02A					
x̄	58.0	36.9	15.9	-	-
s.d.	15.4	8.2	5.5	-	-
range	27.0-89.1	16.8-56.0	8.0-31.7	-	-
N	20	34	47	-	-
01-10-03A					
x̄	38.4	26.1	8.2	-	-
s.d.	14.0	6.5	2.6	-	-
range	18.6-48.4	16.1-39.9	4.2-16.3	-	-
N	3	11	20	-	-
01-10-04A					
x̄	47.7	27.5	7.3	-	-
s.d.	5.0	4.3	1.4	-	-
range	42.7-52.7	20.5-34.8	5.8-11.0	-	-
N	2	12	15	-	-
1-10-05A					
x̄	-	33.1	9.7	-	-
s.d.	-	6.3	-	-	-
range	-	26.8-39.3	9.7	-	-
N	-	2	2	-	-
01-11-02A					
x̄	98.6	45.8	14.5	-	-
s.d.	-	12.0	5.8	-	-
range	-	33.0-62.8	10.3-24.4	-	-
N	1	4	4	-	-
01-11-03A					
x̄	65.1	38.7	18.4	-	-
s.d.	13.6	4.2	7.3	-	-
range	51.5-78.7	34.5-42.8	7.0-16.4	-	-
N	2	2	3	-	-

Table 10. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-11-09A					
$\bar{x}$	69.5	55.2	27.7	-	-
s.d.	7.0	13.6	5.6	-	-
range	62.5-76.4	41.6-68.7	22.1-33.2	-	-
N	2	2	2	-	-
01-14-01A					
$\bar{x}$	85.8	70.7	38.3	-	-
N	1	1	1	-	-
01-15-01A					
$\bar{x}$	64.6	38.9	21.4	-	-
s.d.	25.0	13.2	4.9	-	-
range	39.6-89.5	24.0-56.1	15.8-27.8	-	-
N	2	3	3	-	-
01-15-02A					
$\bar{x}$	34.0	31.5	25.6	-	-
s.d.	9.4	9.7	10.0	-	-
range	16.8-44.3	16.3-47.7	10.2-43.1	-	-
N	6	6	6	-	-

Table 11. Lithic type frequencies for selected chipped stone varieties from 34Lt-32.

Artifact Variety	A	B	C	D	E	F	G	H	I	J	K[1]	K[2]	Total
	Lithic Type												
01-01-01A	11	-	1	-	-	-	-	2	-	-	-	-	14
01-01-02G	1	-	-	-	-	-	-	-	-	-	-	-	1
01-01-02H	2	-	-	-	-	-	-	-	-	1	-	-	3
01-01-02P	-	-	-	-	-	-	-	-	-	1	-	-	1
01-01-06A	2	-	-	1	-	-	-	-	-	-	-	-	3
01-01-06C	1	-	-	-	-	-	-	-	-	-	-	-	1
01-01-07F	-	1	-	-	-	-	-	-	-	-	-	-	1
01-03-01A	1	-	-	-	-	-	-	-	-	-	-	-	1
01-10-01A	2	-	-	-	-	-	-	-	-	-	-	-	2
01-10-02A	33	3	-	1	-	1	-	7	-	2	-	-	47
01-10-03A	12	1	-	3	-	1	1	1	-	1	-	-	20
01-10-04A	11	1	-	-	-	-	-	2	-	1	-	1	16
01-10-05A	2	-	-	-	-	-	-	-	-	-	-	-	2
01-11-02A	2	1	-	-	-	-	-	1	-	-	-	-	4
01-11-03A	2	-	-	-	-	-	-	1	-	-	-	-	3
01-11-09A	2	-	-	-	-	-	-	-	-	-	-	-	2
01-12-01A	19	5	-	1	-	-	-	1	-	4	-	-	30
01-14-01A	-	-	-	-	-	-	-	1	-	-	-	-	1
01-15-01A	3	-	-	-	-	-	-	-	-	-	-	-	3
01-15-02A	4	-	-	-	-	-	2	-	-	-	-	-	6
Total	110	12	1	6	-	2	3	16	-	10	-	1	161
%	68.3	7.5	.6	3.7	-	1.2	1.9	9.9	-	6.2	-	.6	100%

K[1] does not include Boone chert
K[2] only includes those identified as Boone chert

DEBITAGE (16-00)

01-16-01A N=16,582 (Table 12)

Unmodified flake quantities vary both vertically and horizontally. Overall, flakes are more numerous in the upper 30 cm of the deposit.

01-16-01B N=75 (Table 12)

These items represent relatively thick, angular, blocky shaped debitage which are by-products of lithic reduction. Specimens in this variety have been referred to as blocky debris.

Fired Clay *(02)*

CERAMICS (01-00)

Plain Grog, Grit, and Bone Tempered Wares *(02-01-01)*

02-01-01A N=9: 1 Rim sherd, 8 Body sherds

Definition: These thick undecorated sherds exhibit a coarse grog tempered paste with occasional bone and hematite inclusions.

Method of Manufacture: Coiling. The breaks are along coil welds.

Paste:

Tempering: Grog (crushed sherds) represents the primary tempering agent, but bone and hematite inclusions have also been observed.

Texture: The texture is coarse due to large, angular grog inclusions.

Surface Treatment: One sherd has burnished patches on its exterior surface. Most sherds have smoothed exterior and/or interior surfaces.

Color:

Exterior: Five are brown-dark brown (7.5YR 4/4-4/2); two are reddish-brown (5YR 4/4-4/3); one is yellowish-brown (10YR 5/4); and one is red (2.5YR 4/8).

Interior: Four are brown-dark brown (7.5YR 4/4-4/2); two are black (7.5YR 2/0 or 5YR 2.5/1); and one is brown (7.5YR 5/4).

Core: Five sherds have zoned cores and these colors may be the same as the exterior or interior surface color.

Table 12. Vertical distribution of lithic debitage from 34Lt-32.

Square/Artifact Variety	Arbitrary Levels (10 cm) 1	2	3	4	5	6	7	8	9	10	Total
B1-1											
01-16-01A	(63)	-	-	-	-	-	-	-	-	-	63
01-16-01B	(3)	-	-	-	-	-	-	-	-	-	3
B17-22											
01-16-01A	542	1187	390	282	38	8	-	-	-	-	2447
01-16-01B	1	2	2	-	1	-	-	-	-	-	6
B32-22											
01-16-01A	665	729	1014	310	184	35	(8)	-	-	-	2945
01-16-01B	2	3	4	2	2	-	(3)	-	-	-	16
B63-12											
01-16-01A	991	970	747	363	367	363	445	235	104	(1)	4586
01-16-01B	5	7	1	-	3	-	6	2	-	-	24
D2-14											
01-16-01A	425	975	406	277	434	294	182	108	(54)	-	3155
01-16-01B	3	1	4	1	3	-	2	-	-	-	14
D4-13											
01-16-01A	819	1048	591	126	445	282	(75)	-	-	-	3386
01-16-01B	-	-	9	1	-	2	-	-	-	-	12
Total											
01-16-01A	3505	4909	3148	1358	1468	982	710	343	158	1	16,582
01-16-01B	14	13	20	4	9	2	11	2	-	-	75

() indicates incomplete level.

Thickness: Range = 7.4-14.8 mm; $\bar{x}$ = 10.23 mm

Form:

Rim: Direct and straight.

Lip: Flat.

Comments: These sherds are similar to the *Williams Plain* type (Orr 1946: 235 [Spiro 1]; Bell and Dale 1953: 120-123; Brown 1971: 42-55). This kind of pottery has been considered an early undecorated ceramic type in southeastern Oklahoma (Wyckoff 1970a: 98; Galm 1978b: 51). However, it commonly occurs in early Caddoan contexts where it is believed to be a utilitarian ware (Brown 1971: 47-48; Bell 1972: 252).

02-01-01C N=2: 1 Rim sherd, 1 Body sherd

Definition: The grit and grog tempered sherds in this sample are undecorated and relatively thin.

Method of Manufacture: Coiling.

Paste:

Tempering: The tempering agent is crushed sherds (grog) and grit.

Texture: The texture is medium.

Surface Treatment: The exterior of one sherd is slightly burnished.

Color:

Exterior: Light brownish-gray (10YR 6/2).

Interior: Very dark gray (7.5YR 3/0) and brown (10YR 5/3).

Core: One sherd has a zoned core. The other sherd is split so that the exterior surface and part of the core are missing. Core colors are: grayish brown (10YR 5/2) and very dark gray (7.5YR 3/0).

Thickness: 4.5 mm (N=1)

Form:

Rim: Direct and straight.

Lip: Flat.

Comments: Due to their fragmentary condition, these sherds cannot be included within previously defined ceramic types.

Plain Shell Tempered Wares *(02-01-03)*

02-01-03A N=10

Definition: These undecorated body sherds exhibit a coarse shell temper.

Method of Manufacture: Coiling.

Paste:

Tempering: The shell is completely leached out in all of these sherds.

Texture: The texture is coarse.

Surface Treatment: Surfaces are smooth and uneven when present.

Color:

Exterior: Four sherds are reddish-yellow (7.5YR 6/6), three are brown-dark brown (7.5YR 4/2), one is yellowish-brown (10YR 5/6), and two sherds have weathered surfaces.

Interior: Five are very dark gray (10YR 3/1-3/0), four are black (7.5YR 2/0), and one is very dark grayish-brown (10YR 3/2).

Core: Five sherds have zoned cores. Interior core colors are the same as the respective surface color. Exterior core colors include: strong brown (7.5YR 5/6-6/8). Five sherds have unzoned cores: four are very dark gray (10YR 3/1 or 7.5YR 3/0) and one is black (7.5YR 2/0).

Thickness: Range = 4.1-6.5 mm; $\bar{x}$ = 4.86 mm

Comments: Three sherds with similar provenience, thickness, and identical colors probably represent the same vessel. Five other sherds, also recovered together, have similar surface and core colors as well as the same thickness and are considered to be part of one vessel. The amount of leached shell in these sherds is lower than for the other sherds. However, this may reflect their small sherd size. The minimum vessel count is two.

These sherds resemble the *Woodward Plain* type (Hall 1951; Freeman and Buck 1960; Brown 1971: 141-146). This is one of a variety of shell tempered ceramics associated with the Caddoan period (Brown 1971: 220). Evidence suggests that shell tempered ceramics are more prevalent during later Caddoan times but occur infrequently in the early Caddoan period (Brown 1971: 219-223; Bell 1972; Rohrbaugh 1973: 7, 79).

BAKED CLAY (03-00)

(02-03-01A)

This category includes tiny, miscellaneous fragments of fired clay each less than .4 g in weight. They are not associated with features.

Ground Stone *(03)*

MANOS (01-00)

Unifacial Manos *(03-01-01)*

03-01-01A N=3: 1 Complete, 2 Fragmentary (Fig. 13 i)

These sandstone specimens have one flat surface which is ground smooth with occasional pecking marks. The opposite surface is also flat and has pecking and grinding represented. The latter occurs primarily on raised surface areas. Pecked margins and corners suggest that these specimens have been deliberately shaped. The complete specimen has an elongated oval shape.

Bifacial Manos *(03-01-02)*

03-01-02A N=1: 1 Fragmentary (Fig. 13 j)

This sandstone specimen has been bifacially ground smooth. Both surfaces are slightly convex and one face displays a tiny pecked area. The broken edge has evidence of unifacial grinding suggesting that this item continued to be used after it was broken. The edges and end have been shaped by pecking and grinding so that the specimen is roughly oval in shape.

Faceted Manos *(03-01-03)*

03-01-03A N=1: 1 Fragmentary (Fig. 13 h)

This sandstone artifact has one bifaceted surface. Grinding is extensive on both facets. The opposite surface exhibits minimal pecking. This fragment appears to have been deliberately shaped by pecking of its margins.

GROUND/RUBBED HEMATITE (04-00)

03-04-01A N=3: 3 Complete (Fig. 13 e)

These tiny unshaped specimens exhibit surfaces that have been rubbed smooth. Striations are present on one specimen.

Fig. 12. Selected chipped stone artifacts from the Lee Kirkes site (34Lt-32).

a-b: *01-01-01A*
c: *01-01-02G*
d-e: *01-01-02H*
f: *01-01-02P*
g-h: *01-01-06A*
i: *01-01-06C*
j: *01-03-01A*
k-m: *01-12-01A*
n: *01-10-03A*
o: *01-11-03A*
p: *01-10-04A*
q: *01-10-05A*
r: *01-15-02A*

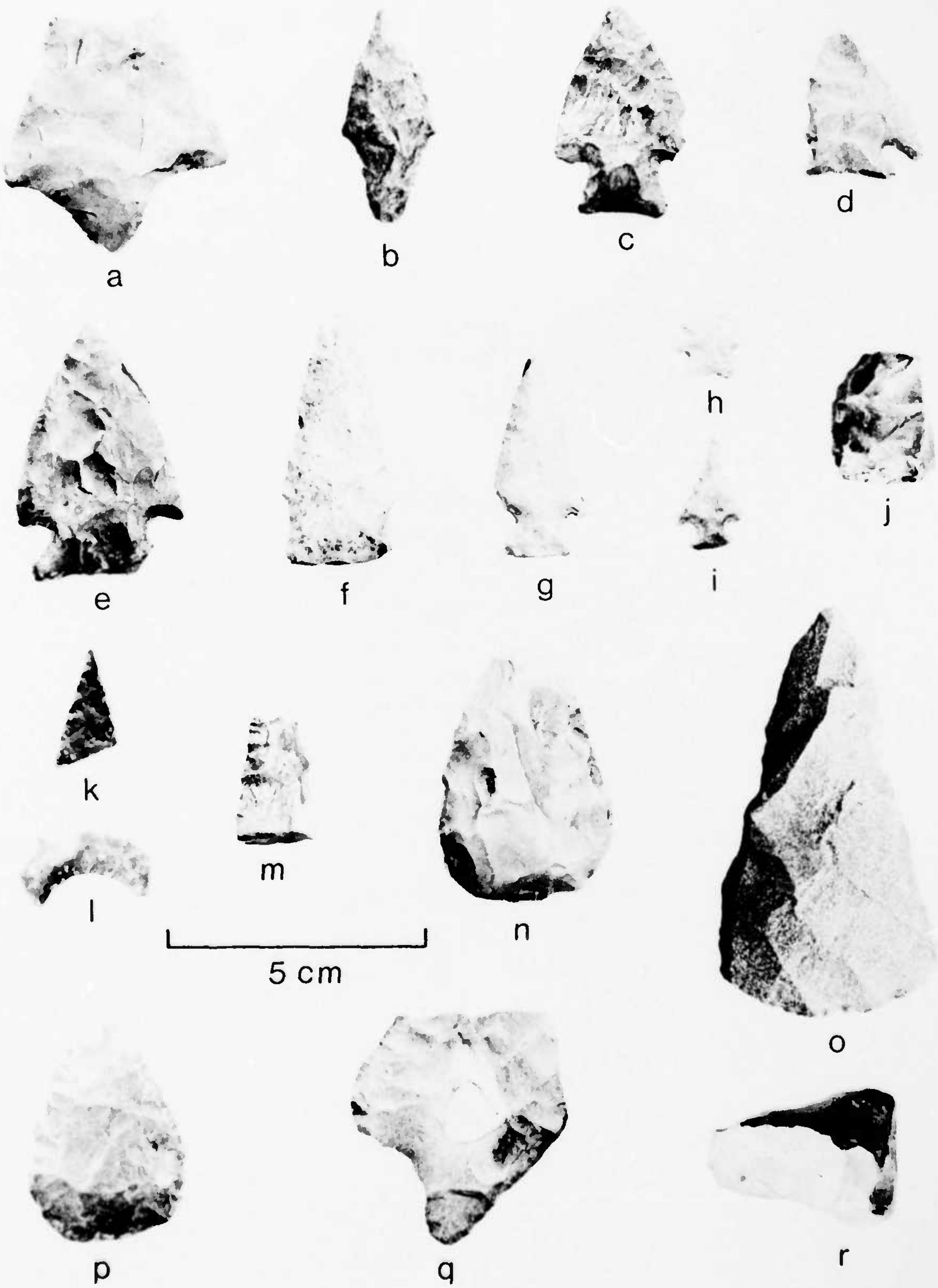

a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
5 cm

Fig. 13. Selected chipped, ground, and pecked/battered stone artifacts from the Lee Kirkes site (34Lt-32).

a: *01-11-09A*

b: *01-14-01A*

c: *01-10-01A*

d: *01-10-02A*

e: *03-04-01A*

f: *01-15-01A*

g: *01-11-02A*

h: *03-01-03A*

i: *03-01-01A*

j: *03-01-02A*

k: *04-01-01A*

l: *04-02-02A*

Note: Artifacts f-l shown at 10 cm scale.

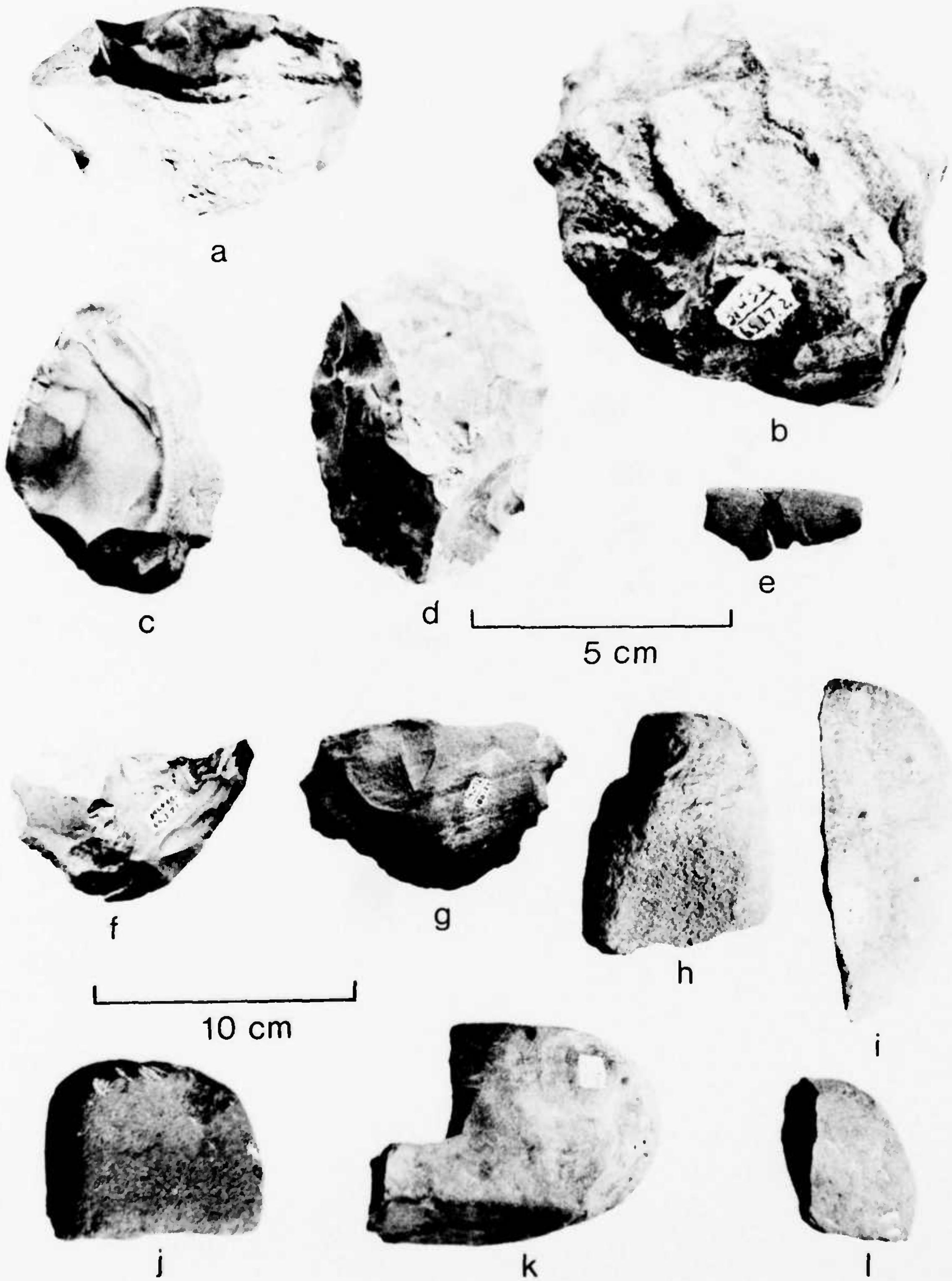

a
b
c
d
e
5 cm
f
g
h
i
10 cm
j
k
l

Table 13. Metric attributes for selected ground and pecked stone varieties from 34Lt-32.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS
03-01-01A			
$\bar{x}$	86.9	67.2	38.5
s.d.	-	-	4.0
range	-	-	32.9-41.8
N	1	1	3
03-01-02A			
$\bar{x}$	-	76.1	50.1
N	-	1	1
03-01-03A			
$\bar{x}$	-	-	68.3
N	-	-	1
03-04-01A			
$\bar{x}$	19.0	10.3	5.3
s.d.	8.8	2.4	2.5
range	9.3-30.6	8.5-13.7	1.8-7.7
N	3	3	3
04-01-01A			
$\bar{x}$	-	77.1	77.6
N	-	1	1
04-02-02A			
$\bar{x}$	-	-	39.8
N	-	-	1

Pecked/Battered/Unmodified Cobbles *(04)*

HAMMERSTONES (01-00)

04-01-01A N=1: 1 Fragmentary (Fig. 13 k)

This irregular sandstone specimen exhibits slight battering and pecking on one convex end which also has two small, spalled areas. A red colored interior and several angular fractures suggest thermal alteration.

PITTED STONES (02-00)

Bifacial Pitted Stones *(04-02-02)*

04-02-02A N=1: 1 Fragmentary (Fig. 13 l)

Shallow, roughly circular pecked depressions are observed on both surfaces as well as small areas which have been ground smooth. The depression interiors are fairly regular and are 1.7-2.5 mm deep. One surface is bifaceted and displays grinding on both facets. This sandstone artifact has been deliberately shaped by pecking and battering of its margins.

UNMODIFIED COBBLES/PEBBLES (04-00)

Fossils *(04-04-02)*

04-04-02A N=1

A fossilized gastropod was recovered from the upper 20 cm of the deposit.

Historic Debris *(07)*

GLASS (01-00)

07-01-01A N=1

This clear fragment was recovered in the upper 20 cm of the deposit.

Faunal *(08)*

BONE/HORN/TEETH (01-00)

08-01-01A N=6

Due to the fragmentary condition of the faunal remains specific

identification is not possible. Three (.5 g) are mammal bone fragments. The remaining three (2.3 g) are bird fragments of turkey size. One is burned. The bones were recovered in two squares between 10-40 cm below ground surface.

SHELL (02-00)

Mollusc *(08-02-01)*

08-02-01A N=1

This freshwater mussel shell fragment (.01 g) is unburned and occurs at a depth of 20-30 cm.

Gastropods *(08-02-02)*

08-02-02A N=15

Unidentified gastropod fragments were collected from the upper 10 cm of the deposit. They are unburned.

Floral *(09)*

A minimal amount (7.1 g) of burned nutshell was recovered from isolated contexts between 20-70 cm below surface. None could be identified.

DISCUSSION AND INTERPRETATIONS

Components

Concentration Indices (CI) which indicate densities-per-level have been calculated for the debitage and artifacts from 34Lt-32 (Table 14). Material from the incomplete levels has not been included for this analysis. Since the remaining levels are of standard size, indices for each level have been computed by dividing the number of artifacts or debitage by the number of excavated levels. A bimodal distribution for both data classes is indicated, with a noticeable break in material densities between Levels 3 and 4. Flake and artifact CI values are highest in Levels 1-3. Based on these data and associated artifact assemblages (Table 15) at least two components are posited. Some overlap and mixing of materials is possible because of bioturbation and

Table 14. Concentration indices for artifacts and debitage from 34Lt-32.

Arbitrary Levels (10 cm)	No. of Excavated Levels	Debitage Count	Flake CI	Artifact Count	Artifact CI
1	5	3453	690.6	27	5.4
2	5	4922	984.4	67	13.4
3	5	3168	633.6	31	6.2
4	5	1362	272.4	19	3.8
5	5	1477	295.4	13	2.6
6	5	984	198.6	10	2.0
7	2	635	317.5	6	3.0
8	2	345	172.5	2	1.0
9	1	104	104.0	2	2.0

excavation of arbitary levels. Radiocarbon dates are lacking from this site.

The first component encompasses materials occurring between 30-40 cm to 94 cm below ground surface and corresponds to Strata III, IV, and V. The upper boundary of Stratum III varies in depth across the site. The associated assemblage is characterized by large expanding stemmed/corner-notched points *(01-01-02)* and an absence of ceramics *(02-01-00)* and small (arrow) points *(01-01-06* and *01-01-07)*. Recognized point types include *Marcos (01-01-02H)* and *Travis (01-01-02P)*. It is not clear whether two contracting stemmed points *(01-01-01A)* are intrusive items or represent minor implement styles within this assemblage. The presence of a single small (arrow) point blade fragment *(01-12-01A)* in Level 5 (Stratum III) is believed due to bioturbation.

The first component may be referrable to the Archaic period. This interpretation is consistent with the postulated assignment from the preliminary investigations (Bobalik 1977: 434). Refined placement within the Archaic period is not possible.

Rock features 78-2, 78-3, and 78-4 are believed associated with this component. Feature 78-2 occurs stratigraphically lower than the other features and may represent an earlier occupational feature. Only a core *(01-14-01A)* and two thick bifaces *(01-10-01A)* are directly associated with the features. This pattern of minimal artifact association with rock concentrations has been observed elsewhere (Bobalik 1977: 398, 491; 1978: 127-135; Galm 1978a: 127). The function of these concentrations could not be determined and could relate to a number of activities. In addition, it is possible that these rock concentrations represent secondary cultural depositions.

The second component at the Lee Kirkes site is distinguished by an assemblage which includes large contracting stemmed points *(01-01-01A)*, ceramics *(02-01-00)*, and small (arrow) points *(01-01-06* and *01-01-07)*. Materials from this assemblage are primarily restricted to the upper 30-40 cm of the deposit and correspond to Strata I and II. Grog tempered *Williams Plain (02-01-01A)* and shell tempered *Woodward Plain (02-01-03A)* represent the ceramic wares. Small point varieties include: corner-notched *(01-01-06A* and *01-01-06C)* and an unclassified side-notched variety *(01-01-07F)*. Large contracting stemmed points *(01-01-01A)* are numerous (Table 15).

Both thin biface IIb specimens *(01-10-05A)* are included with this assemblage and have indications of contracting haft elements. The presence of occasional large expanding stemmed points *(01-01-02)* in Level 3 may be the result of cultural and/or noncultural disturbances. It is also possible that certain supposedly earlier artifact styles continued to be utilized during later occupations. Based on the presence of a side-notched *(01-01-07F)* and several small corner-notched points *(01-01-06)*, and the undecorated grog *(02-01-01)* and shell tempered ceramics *(02-01-02)*, the upper component is tentatively assigned to the early portion of the Caddoan period. This interpretation is in agreement with materials recovered during the preliminary

Table 15. Vertical distribution of selected artifact varieties from 34Lt-32.

Artifact Variety	Arbitrary Levels (10 cm)										Wall Scraping (0-30 cm)	Wall Scraping (0-50 cm)	Wall Scraping (0-80 cm)	Surface	Total
	1	2	3	4	5	6	7	8	9	10					
01-01-01A	3	6	2	2									1		14
01-01-02G			1												1
01-01-02H			1	1				1							3
01-01-02P					1										1
01-01-06A		2	1												3
01-01-06C		1													1
01-01-07F				1											1
01-03-01A					1										1
01-10-01A	1	1													2
01-10-02A	6	12	5	7	4	7	4		1				1		47
01-10-03A	7	3	2	2	3	2								1	20
01-10-04A	2	5	2	3	1		1				1		1		16
01-10-05A		1									1				2
01-11-02A	1	3													4
01-11-03A			1	1				1							3
01-11-09A			1		1										2
01-12-01A (small point fragments)	2	4			1										7
01-12-01A (other)	4	8	5		1	1	2						2		23
01-13-01B	25	35	24	10	16	12	3	6	5				10		146
01-14-01A			1												1
01-15-01A	1	1		1											3
01-15-02A	1	2		1					1					1	6
02-01-01A		5	1									1	2		9
02-01-01C		2													2
02-01-03A		5	4									1	1		11
03-01-01A		2	1												3
03-01-02A		1													1
03-01-03A		1													1
03-04-01A		2	1												3
04-01-01A			1												1
04-02-02A			1												1
Total	53	102	55	29	29	22	10	8	7	0	2	2	18	2	339

testing of this site (Bobalik 1977: 434). The possibility that a Woodland (or Fourche Maline phase) component is included within this upper portion of the site could not be determined.

Feature 78-1, occurring primarily in Stratum II, is tentatively related to the later component. A hammerstone *(04-01-01A)*, large expanding stemmed/corner-notched point *(01-01-06H)* and large contracting stemmed point *(01-01-01A)* are associated with this rock concentration. No function could be discerned for this feature and it is possible that this concentration also represents a secondary cultural deposition.

Lithic Analysis

An examination of the artifacts indicates that all stages of lithic reduction were undertaken at the site. This practice does not appear to have changed through time.

Although cores are minimally represented, other artifacts suggestive of initial reduction have been recorded for both components. These include cobble/quarried block biface I *(01-10-01A)*, split cobble sections *(01-15-01A)*, and tested cobbles *(01-15-02A)*. These items (Table 15) suggest the bifacial reduction of cobbles, split cobbles, and a flake-core technology. Further modification of lithic items at the site is supported by thick bifaces *(01-10-02A)* which often exhibit cortex remnants, and constitute a major portion of both assemblages. Involvement with shaping and thinning at the site is indicated by the thin biface I's *(01-10-03A)* and thin biface II's *(01-10-04A)* in both assemblages. Reworking of implements has also been observed for many of the points *(01-01-00)* and suggests concern with implement maintenance at the site. The only point categories *(01-01-00)* not exhibiting evidence of reworking are the small (arrow) points *(01-01-06* and *01-01-07)* associated with the later component. Additionally, many of the small points *(01-01-06* and *01-01-07)* suggest a flake origin with minimal working of the flake ventral surface.

Examination of the chipped stone artifacts and debitage suggests that locally available materials were consistently used throughout the occupational history of the site (Tables 16 and 17). For most of the major types, stream cobble cortex has been observed on both artifacts and flakes. Therefore, it appears that lithic materials were procured from local stream gravels.

Material type percentages have been provided for debitage from B63-12 (Table 17) and for the chipped stone artifacts (Table 16). These data indicate that locally available Type A is dominant in all levels. Additionally, the debitage and artifacts indicate that nonlocal materials (Type K) are of minor importance for both components. Boone chert is the only nonlocal material type that has been identified.

Table 16. Vertical distribution of chipped stone artifacts from 34Lt-32 according to material types.

Arbitrary Level (10 cm)	Material Types												Total
	A	B	C	D	E	F	G	H	I	J	K^1	K^2	
1	21	1	-	1	-	1	1	1	-	2	-	-	28
2	30	6	1	1	-	-	1	8	-	1	-	1	49
3	12	2	-	3	-	-	-	2	-	3	-	-	22
4	14	2	-	1	-	-	-	2	-	-	-	-	19
5	9	-	-	-	-	-	-	1	-	3	-	-	13
6	6	1	-	-	-	1	-	1	-	1	-	-	10
7	7	-	-	-	-	-	-	-	-	-	-	-	7
8	2	-	-	-	-	-	-	-	-	-	-	-	2
9	2	-	-	-	-	-	-	-	-	-	-	-	2
10	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	103	12	1	6	-	2	2	15	-	10	-	1	152
%	67.8	7.9	.6	3.9	-	1.3	1.3	9.9	-	6.6	-	.6	100%

K^1 does not include Boone chert
K^2 only includes those identified as Boone chert

Table 17. Vertical distribution of lithic debitage according to material type from B63-12 at 34Lt-32.

Arbitrary Levels (10 cm)	Material Types												
	A	B	C	D	E	F	G	H	I	J	K^1	K^2	Total
1	678	101	2	3	6	2	10	142	-	39	11	2	996
2	755	41	-	2	6	2	-	113	-	40	16	2	977
3	560	72	-	8	1	-	9	58	-	28	8	4	748
4	259	24	-	10	1	-	2	42	-	19	6	-	363
5	286	25	-	-	1	1	2	42	-	8	4	1	370
6	279	19	-	-	2	2	3	28	-	15	15	-	363
7	346	20	-	-	1	-	-	51	-	27	5	1	451
8	170	17	-	-	10	1	-	25	-	11	3	-	237
9	67	10	-	2	1	-	-	10	-	3	11	-	104
10	1	-	-	-	-	-	-	-	-	-	-	-	1
Total	3401	329	2	25	29	8	26	511	-	190	79	10	4610
%	73.8	7.1	<.1	.5	.6	.2	.6	11.1	-	4.1	1.7	.2	100%

K^1 does not include Boone chert
K^2 only includes those identified as Boone chert

Only six material types are represented by the artifacts from the lower levels (4-10). For this earlier component, Type A constitutes 75.5% of the artifacts (Table 16). Artifacts from the upper 30 cm of the deposit have been classified into nine material types. Although Type A remains the dominant lithic material for this later assemblage, it has a reduced frequency (63.6%) probably reflecting the increasing use of other lithic types, such as H and B.

The artifact data tentatively suggest subtle differences in material type frequencies between the two assemblages. However, this tendency to use a wider variety of materials during the later component is not readily apparent in the debitage (Table 17). This may be due to a number of factors. The apparent change in artifact material type frequencies may be biased by the relatively small artifact sample, especially from the lower levels. In addition, debitage percentages are based on only one of the excavation units while all of the artifacts have been included. Although considerable reworking of implements has been observed, the nature and extent of implement maintenance relative to different material types is not completely understood. Differential maintenance practices for specific artifact classes or material types could account for differences between artifact and debitage material type percentages. This problem cannot be addressed at this time, but will be considered in future work.

Activities

Lithic reduction appears to be a major activity throughout the occupational history of the site. Both the production of new implements and the maintenance of existing items are indicated for both components. Other activities are tentatively inferred from the artifact assemblages.

Numerous points *(01-01-00)* have been recovered and they may relate to a number of activities. These categories include some specimens which are believed to have functioned as hunting projectiles due to the presence of distal impact fractures. However, they may also include implements that were utilized as knives or scrapers in other activities.

Ground and pecked/battered stone artifacts *(03* and *04)* are only represented in the later component (Table 15). These items include manos *(03-01-00)*, ground hematite *(03-04-01A)*, a hammerstone *(04-01-01A)*, and a pitted stone *(04-02-02)*. The manos *(03-01-00)* and possibly the pitted stone *(04-02-02)* most likely represent implements used in processing vegetal resources. The ground stone hematite fragments *(03-04-01A)* are believed to have been used for pigment.

Ceramic technology is also restricted to the later component (Table 15). These vessels probably reflect cooking activities and possibly storage. No basketry impressions have been observed from this small sample.

Thick biface tools *(01-11-02A)*, a tested cobble tool *(01-11-09A)*, a thin biface I tool *(01-11-03A)*, and modified flakes *(01-13-01B)* are present in the later component artifact assemblage (Table 15). A core *(01-14-01A)* which may also exhibit evidence of wear, a wedge *(01-03-01A)*, a thin biface I tool *(01-11-03A)*, a tested cobble tool *(01-11-09A)*, and modified flakes *(01-13-01B)* are included within the earlier component's assemblage. These implements are believed to have been employed in some undetermined processing activities. Floral *(09)* and faunal *(08)* remains are lacking from this site. As a result, statements regarding the resource base or the season(s) of occupation are not possible for either component.

SUMMARY

Analyses of the data recovered during limited excavations of 34Lt-32 suggest occupations during the Archaic and early portions of the Caddoan periods. No radiometric dates are available to further refine these temporal placements. Currently, evidence suggestive of an occupation during the Woodland period has not been found.

Specialized techniques such as flotation waterscreening, chemical analyses of soils, and so forth could not be conducted because of the abrupt termination of excavations at the site. However, activities inferred from the limited data vary somewhat between components. Lithic reduction and implement maintenance, hunting, cooking, vegetal processing, processing unknown materials, and possibly storage are indicated from the assemblage associated with the later component. The Archaic artifact assemblage suggests concern with lithic reduction and implement maintenance, hunting, and processing of some unknown resources.

The only features observed during the excavations are concentrations of cracked rock. These are believed to occur throughout the occupational history of the site, however their function is undetermined.

This additional evidence further suggests that the Lee Kirkes site represents a base camp during later occupations (Bobalik 1977: 435, 1978: 3-5). During the Archaic period, the site appears to represent a special purpose camp.

CHAPTER 8

THE NATURAL LAKE SITE (34Pu-71)

Christopher Lintz

INTRODUCTION

The Natural Lake site is on a prominent terrace north of a large oxbow lake for which the site is named. The site is on the edge of the modern floodplain approximately 500 m north of Jackfork Creek. The terrace is dissected to the east and lateral erosion behind the terrace edge has produced an east-west oriented ridge. The crest of the terrace is 575 feet (175 m) m.s.l. or approximately 6 m above the active floodplain. Cultural materials are scattered over a 225 m by 100 m area along the ridge and the south slope to the edge of the lake. Recent erosion has incised the south slope in several places resulting in some deflation of cultural materials (Fig. 14). The eastern tip of the ridge has been disturbed by extensive rodent burrowing activities.

The site is currently in pasture but reportedly has been cultivated. A wooden fence along the terrace slope at the west end of the lake leads to a cattle holding pen and feed trough on the terrace crest. The terrace tip is covered with mixed grasses but mature trees surround the lake and grow along the fenceline. The combination of water and shade attracts cattle to the site and the ground around the shore and fenceline has been badly disturbed by the cattle.

The site was reported during the reservoir survey as 34Pu-71, Area B, or the western section (Neal 1972: 5). Previous investigators have considered materials from this area (34Pu-71) to be a part of 34Pu-72 which is across a 130 m wide drainage to the east (Neal 1972: 5; Bobalik 1977: 237). However, these areas are considered to be separate sites since each has produced temporally distinctive artifacts.

During the testing phase, 15 posthole tests along six transects and five random posthole tests were used to assess the depth and nature of subsurface deposits. Four 1 m test squares were also excavated in 10 cm intervals to provide greater control over vertical distributions (Bobalik 1977: 241). A horizontal concentration of sandstone (F76-1) was encountered at a depth of 35-49 cm below surface in Test Square 1 at the west edge of the site.

Based on artifacts recovered during the testing phase, 34Pu-71 has been interpreted as a multicomponent site consisting of Archaic, and later possibly Woodland or early Caddoan, occupations. The site was interpreted as a general purpose locality repeatedly occupied over a long period of time.

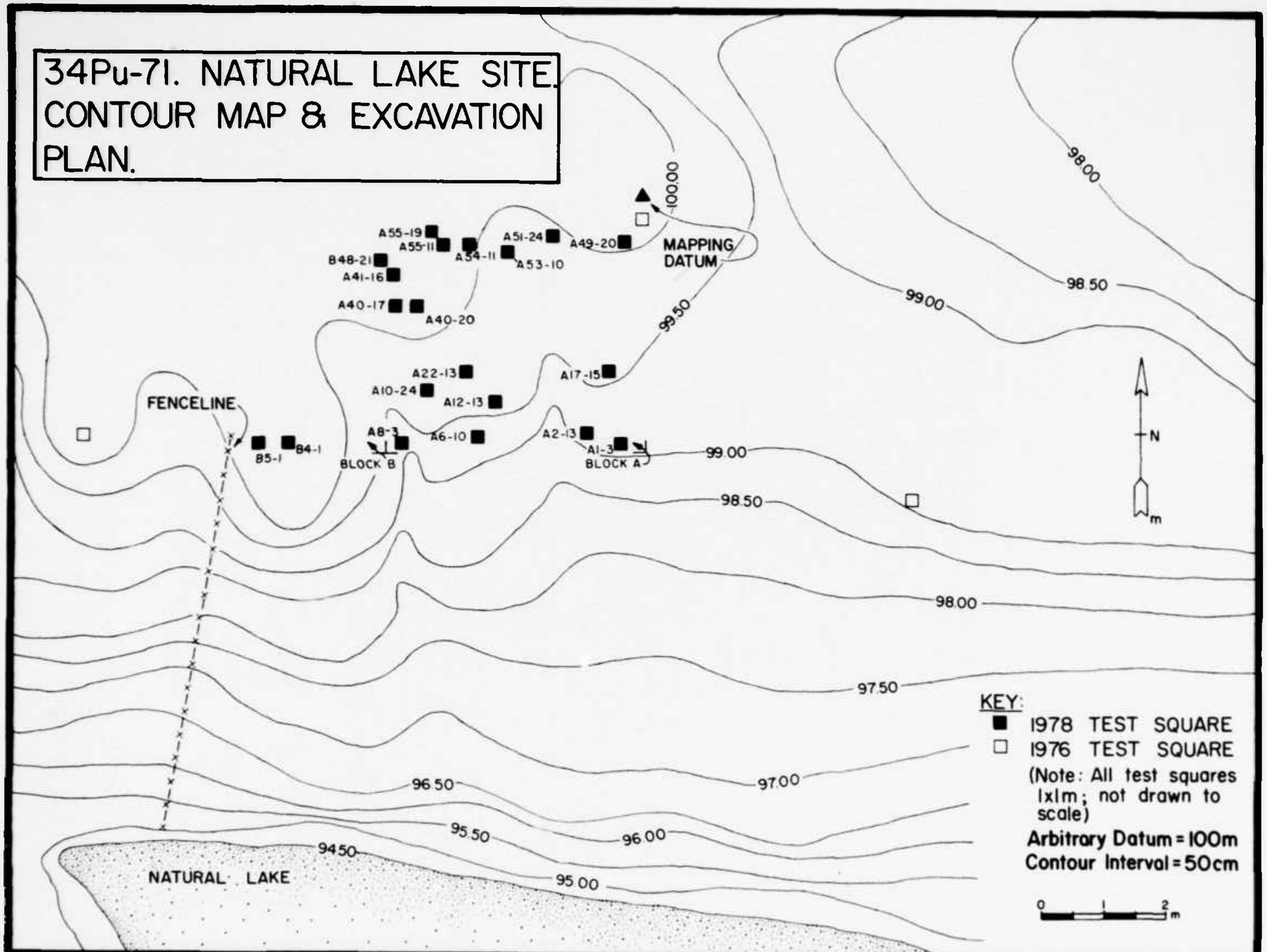


Fig. 14. Contour map and excavation plan of the Natural Lake site (34Pu-71).

The postulated range of activities include hunting, vegetal processing and storage, non-vegetal processing, and lithic reduction (Bobalik 1977: 281).

The site was recommended for additional excavations in view of its proximity to a permanent water supply and the suggestion that it represents one of the more stable campsite localities in the valley. The recovery of Early Archaic materials east of the erosional gully (34Pu-72) suggests that the area may have been reoccupied over a considerable period of time.

EXCAVATION STRATEGIES

Two concentrations of cultural debris were noted during the 1976 investigations (Bobalik 1977: 249). One concentration was at the western edge of the terrace. Excavations of Test Squares 1, 3, and 4 recovered considerable quantities of materials in the upper 40 cm with artifacts extending to a depth of 70 cm. The second concentration was in the southeast portion of the ridge, but the density of materials from Test Square 2 was confined to the upper 10 cm.

A single 40 m by 40 m grid (Block A) was initially superimposed over the western concentration area in 1978. The second concentration area was not tested since materials were shallow in the southeastern portion of the terrace and the area had experienced extensive rodent burrowing activity. The 12 randomly selected test squares in Block A ranged from the crest of the terrace half way down the slope. Five feature numbers were assigned to rock concentrations encountered in the northwest portion of Block A. The waterscreen square A40-20 was placed close to Feature 78-3 in order to obtain greater control over materials associated with the rock feature. Four nonrandom squares were excavated along the top of the terrace to test elevated areas within Block A not sampled by the random tests.

Block B is a 40 m square area immediately west of Block A. It was established to incorporate three squares excavated to further expose Feature 78-2, and to test other prominent rises in the terrace contour.

Each square was excavated in 10 cm intervals and dry screened through ¼-inch mesh hardware cloth. Occasionally, half level (1 m by .5 m by .1 m) was excavated to rapidly verify the cultural sterility of the deposits. A total of 86 complete and three half levels was excavated from 19 squares. In addition, 11 levels excavated in 5 cm increments were waterscreened from a single square (A40-20).

STRATIGRAPHY

Four strata were recognized in the deeper squares near the crest of the terrace. Two randomly selected squares in the north central portion of Block A near the terrace crest were in low areas which may be old erosional gullies. The upper stratigraphy in these squares and the squares

on the lower terrace slopes appear to be truncated or attenuated. Cultural deposits in these same squares were shallow and eroded. This indicates that the culture-bearing strata along the terrace crest were deposited prior to gully formation. Large roots were relatively scarce throughout the stratigraphic sequence, but some rodent activity was encountered in every square.

The strata from A49-20 and B48-21 are representative of the deeper deposits (Fig. 15). Some minor color differences are noted between the squares, but apparently have no cultural significance. All color determinations are derived from dry samples.

Stratum I

This unit is a light yellowish brown (10YR 6/4) sandy loam confined to the upper 10 cm of the deposit. It consists of a mineral fraction mixed with humified organic matter and numerous small rootlets. Cultural materials are abundant.

Stratum II

This unit ranges from 10 to 27-40 cm below surface. It is a compact, brownish yellow (10YR 6/6) sandy loam with occasional specks of hematite. Cultural materials are abundant throughout. A rock concentration (F78-1) occurs at the bottom of this unit.

Stratum III

This horizon ranges from 27-40 to 60 cm below surface and is characterized by abundant hematite concretions throughout the compact, yellow (10YR 7/6) sandy loam. In some squares near the western edge of Block A, the soil color ranges to reddish yellow (7.5YR 6/8). Rock concentrations (F78-2, F78-3, F78-4, and F78-5) occur in the upper and middle portions of this unit. Cultural materials are abundant throughout this stratum.

Stratum IV

This unit is a very hard, compact, brownish yellow (10YR 6/6) sandy clay loam containing occasional hematite nodules. The small quantity of cultural materials in this stratum is believed to be intrusive.

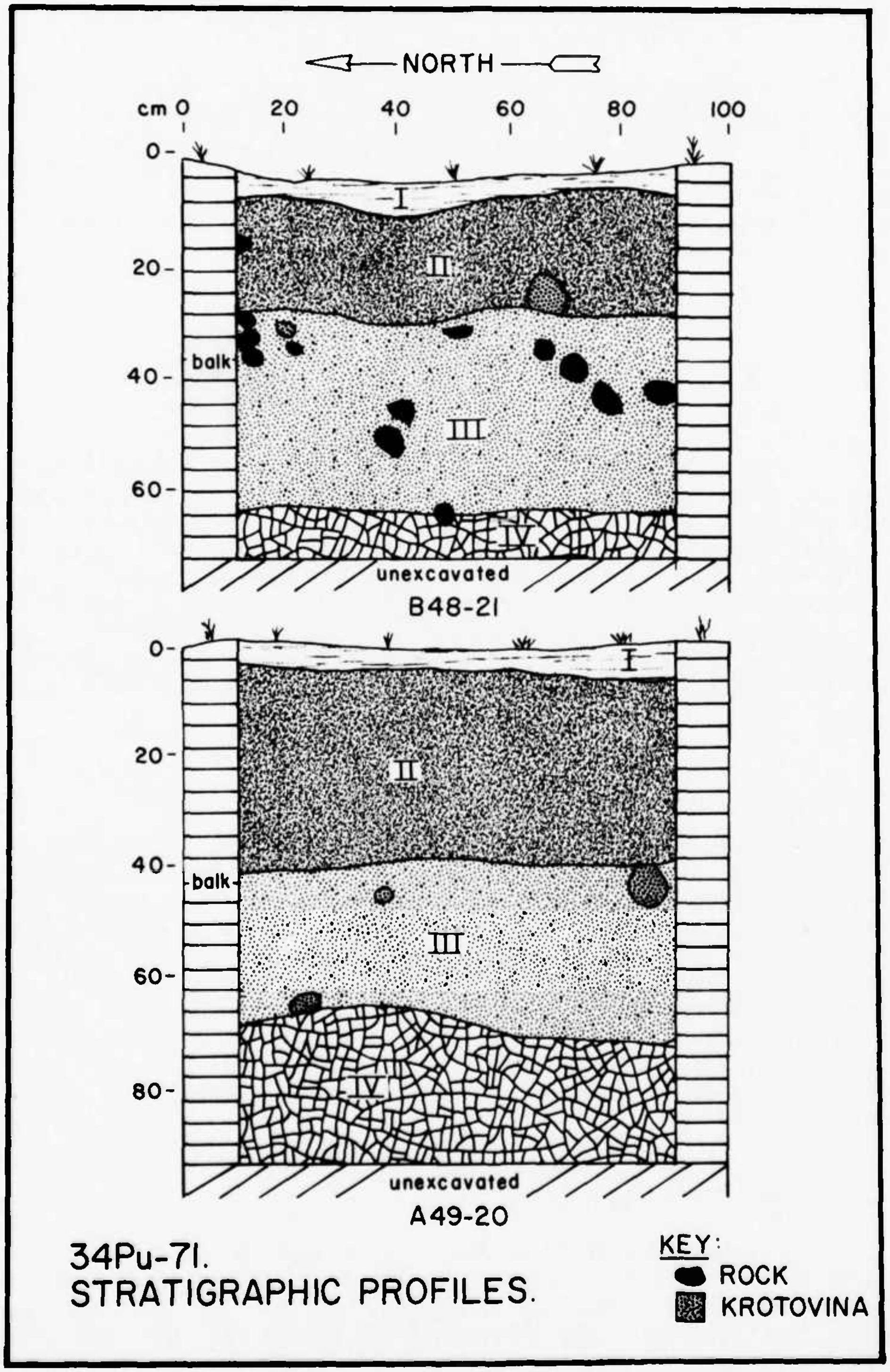


Fig. 15. Stratigraphic profiles from the Natural Lake site (34Pu-71).

FEATURES

Five feature numbers were assigned to rock concentrations in the northwest portion of Block A. The extent of these features could not be determined since they continue into adjacent squares. The different feature-bearing squares ranged from 2-16 m apart. Since most concentrations are composed of the same kind and size nodules and occur at similar depths and stratigraphic situations, several numbers may have been assigned to the same cultural features.

Rock Concentrations

Feature 78-1 (Fig. 16)

This concentration was exposed in A55-11 and A55-19 at a depth of 31-42 cm within the upper portion of Stratum III. Most rocks are subangular sandstone fragments but a few round cobbles were also present. The rocks appear to be sorted by size and range from 3-20 cm in diameter. Neither the rocks nor the surrounding matrix showed evidence of thermal alteration. Associated artifacts include one cobble/quarried block biface I *(01-10-01A)*, three cobble/block biface II/thick bifaces *(01-10-02B)*, one thin biface IIb *(01-10-05B)*, and 153 unmodified flakes *(01-16-01B)*. Most indicate early stages in the manufacturing sequence of chipped stone tools.

Feature 78-2 (Fig. 16)

This feature was encountered in A41-16 and B48-21 at a depth of 29-50 cm. The greatest concentration of rock occurred between 30-40 cm within the upper portion of Stratum III. The rocks are angular sandstone fragments ranging from 3-10 cm in diameter. None show signs of thermal alteration as indicated by cortical discoloration, cracked surfaces, or exfoliation. The surrounding matrix was not oxidized, but a few flecks of charcoal were noted. Associated artifacts include a *Gary (01-01-01A)* and *Agee (01-01-06C)* point, three cobble/block biface II/thick bifaces *(01-10-02A)*, one fragment from a large biface *(01-12-01A)*, 246 unmodified flakes *(01-16-01C)*, one mano *(03-01-01A)*, and a ground slate gorget fragment *(03-05-01A)*.

Feature 78-3 (Fig. 16)

This feature was found in A40-17 at a depth of 30-46 cm within the middle of Stratum III. The rocks ranged from 3-20 cm in diameter and were well sorted angular sandstone fragments. Neither the rocks nor soil matrix appear to be burned. Only 107 unmodified flakes *(01-16-01C)* were associated with the feature.

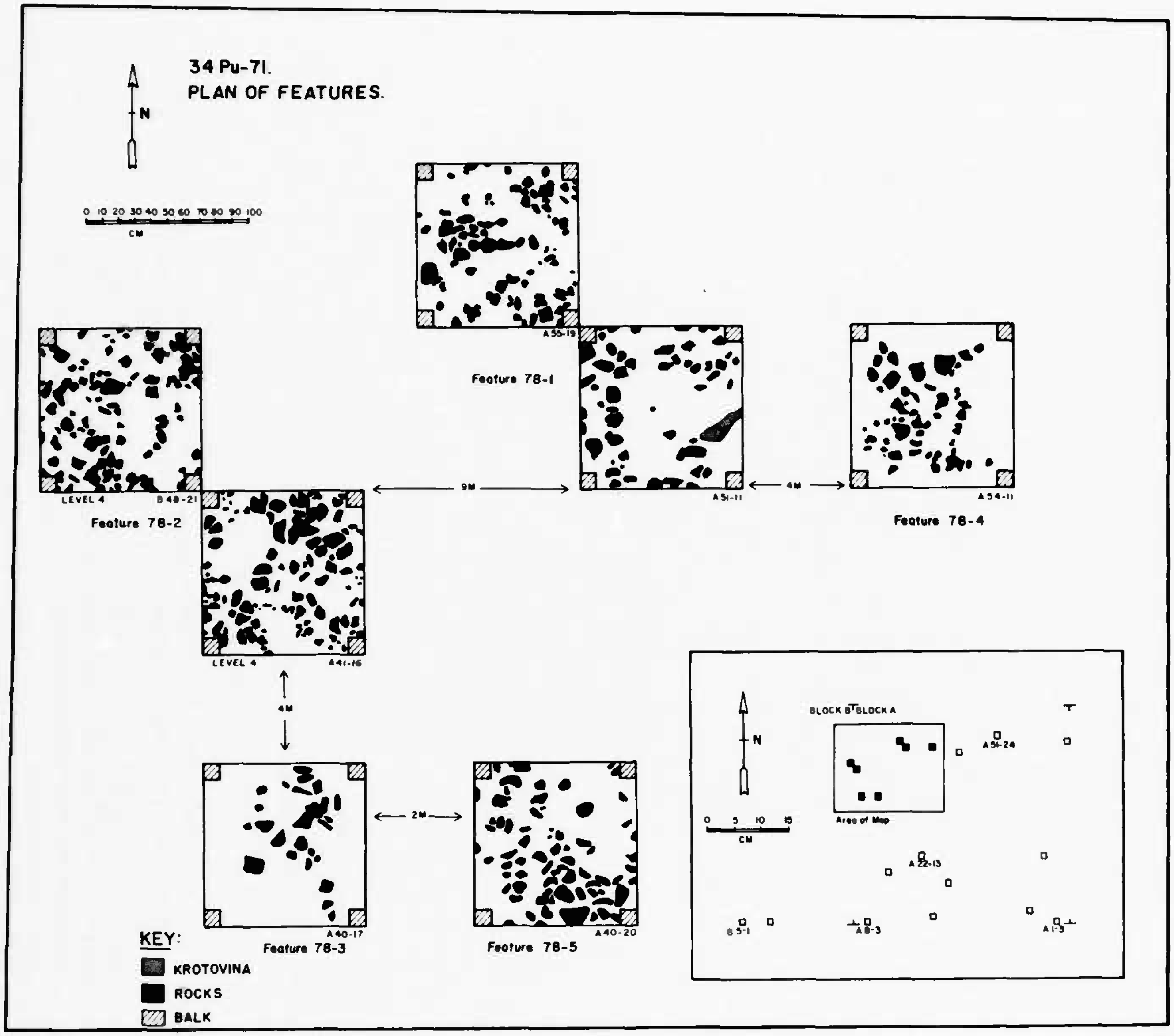


Fig. 16. Plan of features at the Natural Lake site (34Pu-71).

Feature 78-4 (Fig. 16)

This rock concentration is 4 m east of Feature 78-1 in A54-11. It consisted of a horizontal concentration of angular sandstone rocks in the upper portion of Stratum III at a depth of 13-21 cm. No charcoal flecks or oxidized soil were noted in the surrounding matrix, and the rocks did not appear to be thermally altered. Only 118 unmodified flakes *(01-16-01C)* were found in the surrounding feature matrix.

Feature 78-5 (Fig. 16)

This feature was 2 m west of Feature 78-3 in the control square (A40-20). The rocks ranged from 14-47 cm deep, but most were concentrated between 18-30 cm, at the top of Stratum III. The rocks were well sorted by size, and consisted of angular sandstone cobbles which lacked evidence of thermal alteration. Occasional flecks of charcoal were observed in the surrounding matrix. Artifacts associated with the rock concentration include one thin biface IIb *(01-10-05A)* and 102 unmodified flakes *(01-16-01C)*.

CULTURAL REMAINS

The 9947 artifacts and four floral and faunal specimens recovered during 1978 are described in this section. The organizational format follows the classification system outlined in Chapter 6. Specific class, group, category, and variety designations applicable for 34Pu-71 materials are listed in Table 18. Metric attributes of chipped and ground stone tools are summarized in Tables 19 and 20. Specific artifact provenience is provided in the subsequent section concerning intrasite analysis.

Chipped Stone *(01)*

POINTS (01-00)

Large Contracting Stemmed Points *(01-01-01)*

01-01-01A N=9: 3 Complete, 6 Fragmentary (Fig. 17 a-c)

These specimens have acute to rounded tips, broad triangular blades, and straight to slightly convex edges. The shoulders are prominent and well defined (6), rounded (2), or barbed (1). They have contracting stems and rounded bases. A cortical surface is present on the base of one specimen. Flaking on four specimens is relatively crude. One specimen has a needle-like tip and sharp edges. All are biconvex in cross section.

<u>Comments</u>: These specimens resemble the *Gary* type.

Table 18. Summary of artifact categories and varieties from 34Pu-71.

Chipped Stone *(01)*

POINTS (01-00)
- Large Contracting Stemmed Points *(01-01)*
  - *01-01A*
- Large Expanding Stemmed/Corner-Notched Points *(01-02)*
  - *01-02A*
  - *01-02E*
  - *01-02J*
  - *01-02L*
- Large Straight Stemmed Points *(01-04)*
  - *01-04D*
- Large Unstemmed Points *(01-05)*
  - *01-05A*
- Small Expanding Stemmed/Corner-Notched Points *(01-06)*
  - *01-06C*

DRILLS (02-00)
- Shaped Base Drills *(02-01)*
  - *02-01A*
- Flare Base Drills *(02-02)*
  - *02-02A*

BIFACES (10-00)
- Cobble/Quarried Block Biface I *(01-01)*
  - *01-01A*
- Cobble/Block Biface II/Thick Biface *(10-02)*
  - *10-02A*
- Thin Biface I *(10-03)*
  - *10-03A*
- Thin Biface IIa *(10-04)*
  - *10-04A*
- Thin Biface IIb *(10-05)*
  - *10-05A*

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)
  - *12-01A*

MODIFIED FLAKES (13-00)
  - *13-01B*

SPLIT/TESTED COBBLES (15-00)
- Split Cobbles *(15-01)*
  - *15-01A*
- Tested Cobbles *(15-02)*
  - *15-02A*

DEBITAGE (16-00)
  - *16-01A*

Table 18. Continued

Fired Clay *(02)*

CERAMICS (01-00)
Plain Grog, Grit, and Bone Tempered Wares *(01-01)*
01-01A

Ground Stone *(03)*

MANOS (01-00)
Unifacial *(01-01)*
01-01A
Bifacial *(01-02)*
01-02A

METATES/GRINDING SLABS (02-00)
02-01A

GORGETS (05-00)
05-01A

MISCELLANEOUS GROUND STONE IMPLEMENTS (06-00)
Ground Stone Fragments *(06-03)*
06-03A
Small Grooved Nodule *(06-04)*
06-04A

Pecked/Battered/Unmodified Cobbles *(04)*

HAMMERSTONES (01-00)
01-01A

UNMODIFIED COBBLES/PEBBLES (04-00)
Unmodified Nodules *(04-04)*
04-04A
04-04B

Historic Debris *(07)*

GLASS (01-00)
01-01A

CROCKERY/CERAMICS (02-00)
Stoneware *(02-01)*
02-01A
Ironstone/Porcelain *(02-02)*
02-02C

METAL (03-00)
Spike *(03-02)*
03-02A

Table 18. Continued

Fence Staple *(03-04)*
03-04A
Slug *(03-07)*
03-07A
Unidentified Scraps *(03-09)*
03-09A
Faunal *(08)*
BONE/HORN/TEETH (01-00)
01-01A
Floral *(09)*

References: Bell 1958: 28, Pl. 14, Suhm and Jelks 1962: 197, Pl. 99.

Large Expanding Stemmed/Corner-Notched Points *(01-01-02)*

01-01-02A N=1: 1 Complete (Fig. 17 d)

This specimen has a broad triangular blade, acute tip, straight edges, slightly barbed shoulders, slightly expanding stem and a relatively straight base. The tangs and shoulders are sharply defined and the corner notches are broad. The stem portion constitutes approximately half the total specimen length. It has a biconvex cross section.

Comments: It resembles a *Lange* point, but the stem-to-blade ratio is high. This specimen may have been extensively reworked.

References: Bell 1958: 36, Pl. 18; Suhm and Jelks 1962: 203, Pl. 102.

01-01-02E N=1: 1 Complete (Fig. 17 g)

This item is relatively short and has a rounded tip, asymmetrical, slightly convex edges, narrow and shallow corner notches, and a straight base. The shoulders and tangs are rounded. The widest part of the specimen occurs at the tangs. It is subtriangular in cross section. An impact fracture flake scar extends across the length of one blade face. Reworking of the specimen has probably caused the asymmetrical edge, blunt tip, and short length measurement.

Comments: This specimen resembles the *Trinity* type.

References: Bell 1958: 96, Pl. 48; Suhm and Jelks 1962: 253, Pl. 127.

01-01-02J N=2: 1 Complete, 1 Fragmentary (Fig. 17 e-f)

Items in this variety have straight and slightly convex edges, poorly defined shoulders, straight to weakly expanding stems, and straight to concave bases. The shoulders form the widest portion of these specimens. Neither the shoulders nor tangs are well defined. The stem edges on one specimen are ground. Cross sections are biconvex.

Comments: These resemble the *Yarbrough* type.

References: Bell 1960: 98, Pl. 49; Suhm and Jelks 1962: 261, Pl. 131.

01-01-02L N=2: 1 Complete, 1 Fragmentary (Fig. 17 j-k)

These items have straight to slightly convex blade edges, rounded shoulders, broad but shallow corner notches, expanding stems, rounded tangs and straight to convex bases. The shoulder area constitutes the widest portion of these points. Cross sections are biconvex.

<u>Comments</u>: These specimens resemble *Edgewood* or *Fairland* types.

<u>References</u>: Bell 1958: 20, Pl. 10; 1960: 38, Pl. 19; Suhm and Jelks 1962: 183, Pl. 92, and 191, Pl. 96.

Large Straight Stemmed Points *(01-01-04)*

01-01-04D N=2: 2 Fragmentary (Fig. 17 h)

Both specimens have unknown tip and blade morphologies, prominent shoulders, long straight stems, and slightly convex bases. The shoulders are the widest portion of the point. Tangs are prominent. Both have biconvex cross sections.

<u>Comments</u>: Both points resemble the *Bulverde* type.

<u>References</u>: Bell 1960: 12, Pl. 6; Suhm and Jelks 1962: 169, Pl. 85.

Large Unstemmed Points *(01-01-05)*

01-01-05A N=1: 1 Fragmentary (Fig. 17 i)

This specimen has straight blade edges, rounded tangs, and a concave base. The distal blade edges are alternately beveled and the proximal edges are heavily ground. Basal thinning was achieved by the bifacial removal of multiple flakes. The cross section is biconvex and blade edges are offset as a result of resharpening.

<u>Comments</u>: This item resembles the *Dalton* type.

<u>References</u>: Bell 1958: 18, Pl. 9.

Small Expanding Stemmed/Corner-Notched Points *(01-01-06)*

01-01-06C N=1: 1 Complete (Fig. 17 l)

The distal end of this specimen has a delicate, non-serrated, parallel-sided projection with an acute tip. The blade is wider with concave serrated edges, prominent, non-barbed shoulders, a broad, slightly expanding stem and a slightly convex base. The tangs are rounded. Both faces show extensive thermal spalling. The cross section could not be determined.

<u>Comments</u>: This specimen resembles the *Agee* type.

<u>References</u>: Brown 1976: 73, Figure 14; Perino 1968: 4, Pl. 2.

DRILLS (02-00)

01-02-01A N=2: 1 Complete, 1 Fragmentary (Fig. 17 n-o)

These specimens are made from large expanding stemmed/corner-notched points. One specimen has a narrow shank with a distinct shank-base juncture. The blade edges of the original point are straight with prominent barbed shoulders formed by deep, but narrow corner notches. The stem is expanding, tangs are angular, and the base is straight. The original point conforms to the *Marcos* type *(01-01-02H)* as described by Bell (1958: 42, Pl. 21).

The second specimen has a less distinct juncture between the drill and point sections. This specimen has a blunt tip, concave blade edges, prominent but non-barbed shoulders, slightly expanding stem and a straight base. The drill shank is alternately beveled and dull while the blade edges are not. This point does not conform to described types but is within the range of variety *01-01-02Q*.

01-02-02A N=1: 1 Fragmentary (Fig. 17 p)

This item is a broken flake base drill. The base displays some bifacial modification, but largely reflects the shape of the original flake. The shank is constricting.

BIFACES (10-00)

Cobble/Quarried Block Biface I *(01-10-01)*

01-10-01A N=10: 9 Complete, 1 Fragmentary

Items in this category are large bifacially worked cobbles which have sinuous edges and cortex covering at least half of one face. Most specimens have some cortex on both faces. These items have thick, irregular cross sections. Their shape reflects the morphology of the original cobble. One specimen shows battering on the ridge of a cortical face. The battering may reflect attempts to split the nodule or previous use as a hammerstone or anvil.

Cobble/Block Biface II/Thick Biface *(01-10-02)*

01-10-02A N=48: 27 Complete, 21 Fragmentary (Fig. 18 b,e)

These items are large, bifacially worked cobbles with sinuous to slightly sinuous edges and cortex covering less than half of one face. They have thick, irregular cross sections. The shapes of most specimens (94%) reflect the original cobble morphology. However, three specimens have a circular form.

Thin Biface I *(01-10-03)*

01-10-03A N=19: 2 Complete, 17 Fragmentary (Fig. 18 c)

These specimens reflect some concern for thinning and shaping. They have slightly sinuous edges and are considerably thinner than the previous variety. Cortical surfaces are present on one artifact. These specimens exhibit an elongated oval form.

Thin Biface IIa *(01-10-04)*

01-10-04A N=2: 2 Complete (Fig. 17 m)

These specimens are thin, carefully shaped specimens with slightly sinuous to non-sinuous edges and no evidence of a hafting element. One specimen has a small triangular form and may represent a small point preform. The second specimen is lunate and shows careful bifacial retouch. This item may represent a reworked barb from a *Calf Creek* point (Perino 1968: 14).

Thin Biface IIb *(01-10-05)*

01-10-05A N=8: 2 Complete, 6 Fragmentary (Fig. 17 q)

These specimens are carefully shaped thin bifaces with slightly sinuous to regular edges and some indication of a hafting element. The edge alteration is not as refined as that displayed on the points. The shoulders and tangs are rounded and notching is shallow. Six specimens represent large contracting stemmed points, and two are large corner-notched expanding stemmed forms. Three specimens have plano-convex and five have biconvex cross sections.

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)

01-12-01A N=39

These specimens represent broken portions of large points and thin bifaces. They have thin convex cross sections and are carefully shaped. Thirty three percent have slightly sinuous edges. Distal tip sections constitute 60%, midsections 23%, proximal ends 13%, and barbs 3% of the sample. All base sections are from large corner-notched/expanding stemmed or straight stemmed points. One midsection has straight, serrated blade edges and short barbed shoulders.

MODIFIED FLAKES (13-00)

01-13-01B N=10

These specimens display some unifacial modification along one or more

Table 19. Metric attributes for selected chipped stone varieties from 34Pu-71.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-01A					
$\bar{x}$	62.5	29.2	8.8	20.0	20.9
s.d.	16.5	5.1	1.7	3.4	3.9
range	46.0-79.0	22.5-36.0	6.0-12.0	16.0-26.0	17.4-30.0
N	2	6	9	8	8
01-01-02A					
$\bar{x}$	61.5	42.7	8.5	23.0	12.0
N	1	1	1	1	1
01-01-02E					
$\bar{x}$	27.0	18.5	5.6	7.0	16.0
N	1	1	1	1	1
01-01-02J					
$\bar{x}$	42.0	24.2	7.4	14.5	16.0
s.d.	-	4.6	-	0.5	1.0
range	-	19.6-28.7	-	14.0-15.0	15.0-17.0
N	1	2	2	2	2
01-01-02L					
$\bar{x}$	38.2	21.3	7.2	13.8	12.1
s.d.	-	0.3	0.2	1.8	3.1
range	-	21.0-21.6	7.0-7.4	12.0-15.5	9.0-15.2
N	1	2	2	2	1
01-01-04D					
$\bar{x}$	-	34.4	8.0	17.0	18.0
s.d.	-	-	1.0	3.0	1.0
range	-	-	7.0-9.0	14.0-20.0	17.0-19.0
N	-	1	2	2	2
01-01-05A					
$\bar{x}$	58.0	25.0	7.4	-	-
N	1	1	1	-	-
01-01-06C					
$\bar{x}$	25.5	16.0	2.5	5.0	7.0
N	1	1	1	1	1

Table 19. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-02-01A					
$\bar{x}$	33.6	26.4	6.3	11	18.5
s.d.	3.4	5.2	0.7	1.0	-
range	30.3-37.0	22.0-33.8	5.4-7.0	10.0-12.0	-
N	2	3	3	2	1
01-10-01A					
$\bar{x}$	62.1	51.2	30.5	-	-
s.d.	8.0	7.8	5.7	-	-
range	48.0-72.3	36.3-63.5	23.0	-	-
N	10	10	10	-	-
01-10-02A					
$\bar{x}$	54.5	42.0	18.0	-	-
s.d.	13.3	11.7	7.3	-	-
range	26.0-78.0	22.5-70.0	6.3-39.0	-	-
N	31	30	47	-	-
01-10-03A					
$\bar{x}$	39.7	31.0	8.4	-	-
s.d.	-	6.1	2.6	-	-
range	-	21.3-40.5	5.0-15.0	-	-
N	1	5	17	-	-
01-10-04A					
$\bar{x}$	31.8	19.1	5.3	-	-
s.d.	0.2	7.6	0.8	-	-
range	31.6-32.0	11.5-26.7	4.5-6.0	-	-
N	2	2	2	-	-
01-10-05A					
$\bar{x}$	48.0	34.1	8.2	-	-
s.d.	3.6	9.1	1.3	-	-
range	44.4-51.6	21.0-45.4	6.4-10.4	-	-
N	2	7	8	-	-

Table 19. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-15-01A					
$\bar{x}$	46.0	44.2	21.0	-	-
s.d.	3.3	8.3	2.6	-	-
range	43.0-50.6	38.0-56.0	18.4-24.5	-	-
N	3	3	3	-	-
01-15-02A					
$\bar{x}$	73.0	-	20.0	-	-
s.d.	-	-	3.5	-	-
range	-	-	17.0-23.0	-	-
N	1	-	4	-	-

edges. The flake morphology largely reflects the flake prior to modification. The edge alteration occurs as continuous but irregular, minute flake scars on four specimens; as continuous, regular flake scars on two specimens; and as non-continuous, irregular flake scars on the remaining four specimens. Eight specimens display modification along a straight edge and modification occurs along one concave and one convex edge.

SPLIT/TESTED COBBLES (15-00)

Split Cobbles *(01-15-01)*

01-15-01A N=3: 3 Complete

These specimens are split cobble sections and are characterized by an irregular plano-convex form. The shapes largely reflect the original cobble morphology. All exhibit some flaking even though cortex covers most of the dorsal surface.

Tested Cobbles *(01-15-02)*

01-15-02A N=6: 6 Complete (Fig. 18 a)

These items are amorphous nodules of chert displaying from one to six non-continuous flake removals. Most surfaces exhibit cortex and the shapes reflect the original cobble morphology.

DEBITAGE (16-00)

01-16-01A N=9745

These specimens represent unmodified flake debitage. The majority were obtained during the excavations but 105 were collected from the surface.

Fired Clay *(02)*

CERAMICS (01-00)

Plain Grog, Grit, and Bone Tempered Wares *(02-01-01)*

02-01-01A N=1: 1 Body sherd

Definition: A moderately textured, grog tempered, undecorated ware.

Method of Manufacture: Indeterminate.

Paste:

Tempering: Primarily grog (crushed sherds) with a small amount of grit. The temper constitutes approximately half of the paste characteristics.

Texture: The texture is moderate.

Surface Treatment: Smooth with occasional pitting. It is slightly eroded.

Color:

Exterior: Light reddish brown.

Interior: Black.

Thickness: 11.8 mm.

Form: Indeterminate.

Minimum Number of Vessels: 1.

Comments: This ware resembles *Williams Plain* (Brown 1971: 42).

Ground Stone *(03)*

MANOS (01-00)

Unifacial Manos *(03-01-01)*

03-01-01A N=3: 3 Complete (Fig. 18 f)

These specimens are sandstone cobbles which show grinding and smoothing on one surface. Opposite surfaces are irregular or pitted. One specimen has been carefully shaped into a rectangular loaf-shaped form. The others are irregular, lack edge pecking modification, and reflect the shape of the original cobble.

Bifacial Manos *(03-01-02)*

03-01-02A N=2: 2 Complete (Fig. 18 g)

These items are irregularly shaped, sandstone cobbles which have grinding and smoothing on both faces. Neither shows shaping and their morphology reflects the natural cobble form.

Table 20. Metric attributes for selected ground and pecked stone varieties from 34Pu-71.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS
03-01-01A			
$\bar{x}$	116.8	92.6	54.4
s.d.	23.2	17.4	6.7
range	90.0-150.5	79.3-114.1	46.1-63.0
N	5	5	5
03-02-01A			
$\bar{x}$	237.0	194.5	62.5
s.d.	7.0	34.5	2.5
range	230.0-244.0	160.0-229.0	60.0-65.0
N	2	2	2
03-05-01A			
$\bar{x}$	23.6	18.4	4.1
N	1	1	1
03-06-03A			
$\bar{x}$	58.8	48.8	36.9
s.d.	9.2	6.4	5.2
range	50.0-57.4	42.0-57.4	32.0-44.2
N	3	3	3
03-06-04A			
$\bar{x}$	23.1	19.1	9.2
N	1	1	1
04-01-02A			
$\bar{x}$	79.0	63.5	47.0
N	1	1	1
04-04-04A			
$\bar{x}$	39.6	29.1	11.4
N	1	1	1

METATES/GRINDING SLABS (02-00)

03-02-01A N=2: 1 Complete, 1 Fragmentary (Fig. 18 h)

These items are large tabular sandstone slabs which have grinding and peck marks on one flat surface. Neither slab has been intentionally shaped. One has been burned.

GORGET (05-00)

03-05-01A N=1: 1 Fragmentary (Fig. 18 b)

This item is a thin, triangular shaped fragment of slate with grinding on both faces and along one edge. A portion of a biconically drilled hole occurs at the apex of the fragment opposite the ground edge. The curvature of the ground edge suggests that the complete specimen may have been circular or oblong with one or more holes drilled near the edge. This item probably represents a ground slate gorget.

MISCELLANEOUS GROUND STONE IMPLEMENTS (06-00)

Ground Stone Fragments *(03-06-03)*

03-06-03A N=3: 3 Fragmentary

These fragmentary specimens may be parts of ground stone tools. They are irregularly shaped with one smoothed, flat surface. No peck marks, grinding, or smoothing striations are macroscopically apparent.

Grooved Ground Stone Implements *(03-06-04)*

03-06-04A N=1: 1 Complete

This item is a small, modified, fine grained sandstone nodule. It has an oval shape with a plano-convex cross section. A single groove encircles the specimen near the edge of the oval form. The convex surface is smooth with occasional microscopic striations while the planar surface is irregular. Polish is present on the ridges of the planar surface, but not on the convex surface.

Pecked/Battered/Unmodified Cobbles *(04)*

HAMMERSTONES (01-00)

04-01-01A N=1: 1 Complete

This is a multifunctional implement with areas of both extensive

grinding and battering. The fine grain sandstone nodule is oval in outline with a triangular cross section. All three major surfaces show extensive smoothing, but are also heavily battered.

UNMODIFIED COBBLES/PEBBLES (04-00)

Unmodified Nodules-Special Context *(04-04-04)*

04-04-04A N=1: 1 Complete

This is an oval pebble which has smooth surfaces, but no clear indication of modification. It is large in size (39.6 by 29.1 by 11.4 mm). This is presumably a manuport.

04-04-04B N=3

These specimens are small pieces of natural asphalt (grahamite). Asphalt was used prehistorically for hafting tools, as well as during the late historic period (Anonymous 1972). The historic asphalt mines at Sardis are located approximately 2.5 km (1.5 miles) west of the site.

Historic Debris *(07)*

GLASS (01-00)

07-01-01A N=4

Four pieces are from a single clear glass bottle. None have maker's marks or molding seams. The bottle form is indeterminate.

CROCKERY/CERAMICS (02-00)

07-02-01A N=1

This specimen is a small sherd of gray salt glazed stoneware. The size and shape of the vessel are indeterminate.

07-02-02C N=3

These items are portions of a thin ironstone saucer. One small rim fragment has a single thin, indigo blue line on the upper rim adjacent to the edge.

Fig. 17. Selected chipped stone artifacts from the Natural Lake site (34Pu-71).

a-c:	*01-01-01A*
d:	*01-01-02A*
e-f:	*01-01-02J*
g:	*01-01-02E*
h:	*01-01-04D*
i:	*01-01-05A*
j-k:	*01-01-02L*
l:	*01-01-06C*
m:	*01-10-04A*
n-o:	*01-02-01A*
p:	*01-02-02A*
q:	*01-10-05A*

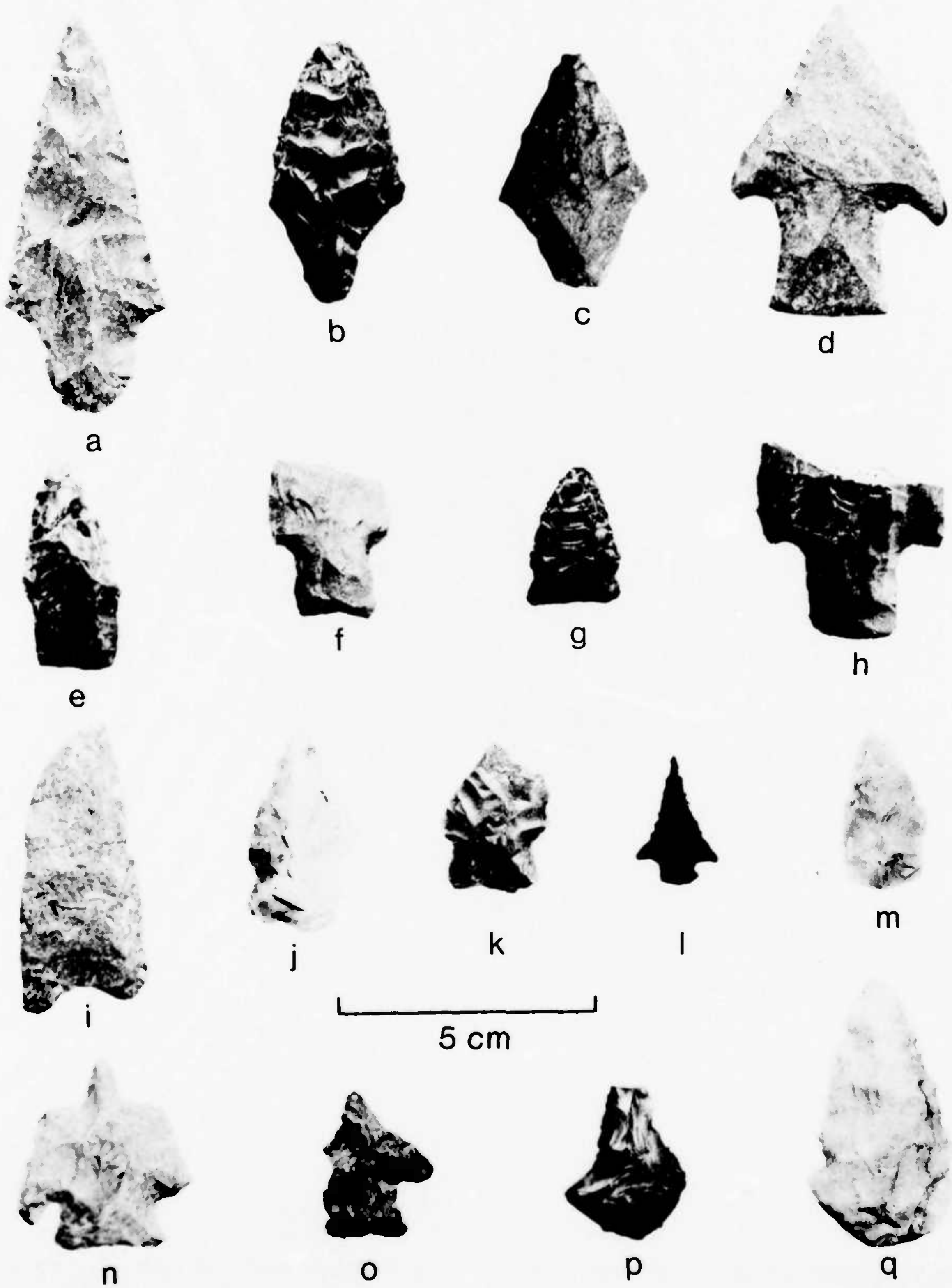
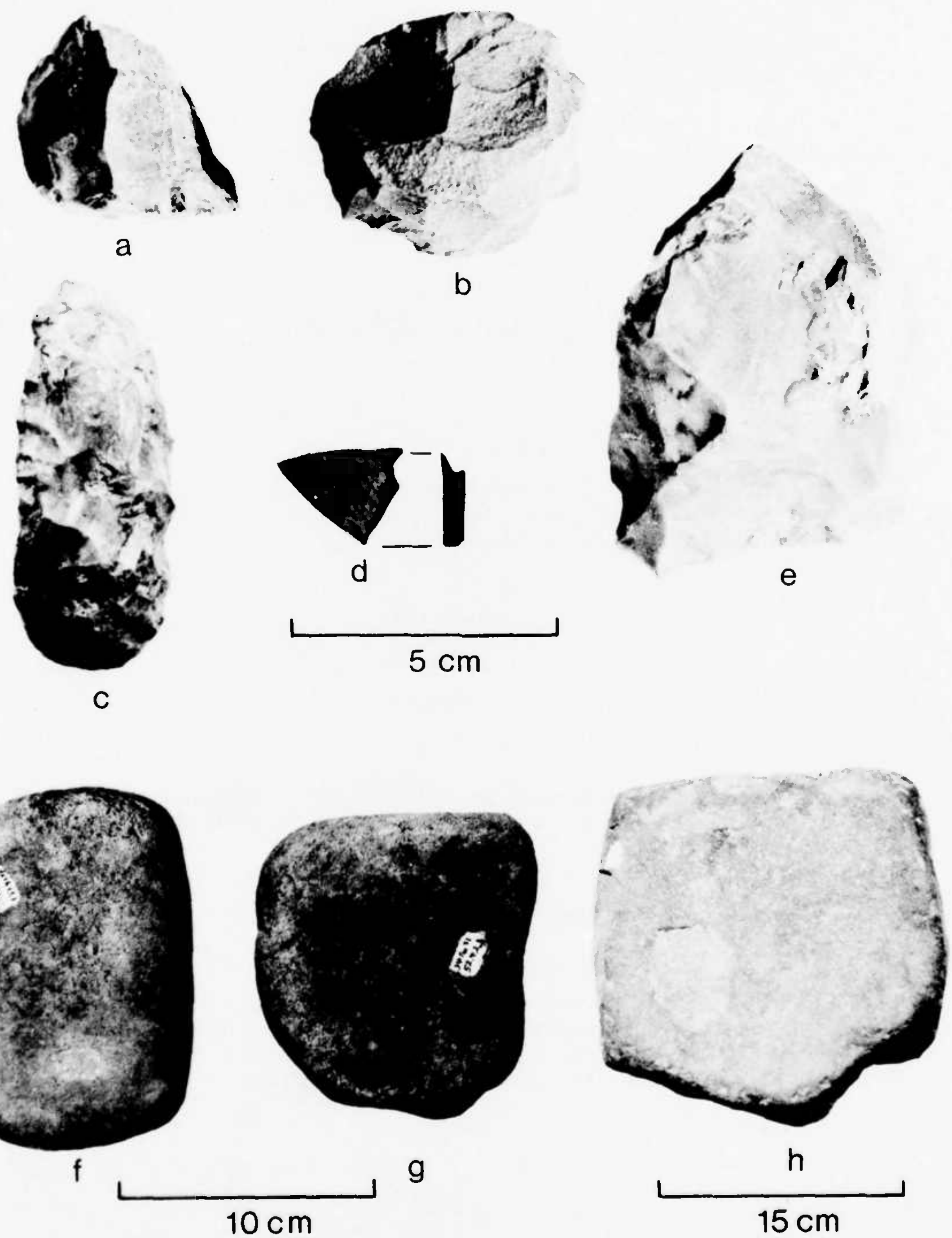

a
b
c
d
e
f
g
h
i
j
k
l
m
5 cm
n
o
p
q

Fig. 18. Selected chipped, ground, pecked/battered stone artifacts from the Natural Lake site (34Pu-71).

a: *01-15-02A*
b,e: *01-10-02A*
c: *01-10-03A*
d: *03-05-01A*
f: *03-01-01A*
g: *03-01-02A*
h: *03-02-01A*

Note: Artifacts f and g are shown at 10 cm scale while h is shown at 15 cm scale.


a
b
c
d
e
5 cm
f
g
h
10 cm
15 cm

METAL (03-00)

07-03-02A N=1

This specimen is a 96 mm long iron spike with a subrectangular head. The specimen is heavily corroded.

07-03-04A N=1

This item is a heavily corroded fragment of a U-shaped fence staple.

07-03-07A N=1

This item is a 24.7 mm long, copper jacketed slug from a .22 calibre bullet.

07-03-09A N=6

This category includes miscellaneous metal scraps. Three are lead and three are heavily corroded iron. One of the iron scraps is folded. The shapes of the original items are unknown.

Faunal *(08)*

BONE/HORN/TEETH (01-00)

08-01-01A N=1

This specimen is a heavily worn, lower left third molar of a deer. It was found on the surface and may not relate to prehistoric cultural activities at the site.

Floral *(09)*

Floral materials were scarce. Occasional flecks of charcoal and three nutshells were recovered. All of the latter items are from Level 1 in A55-11. Their unburned condition and stratigraphic position suggest that they may postdate aboriginal occupations of the site.

DISCUSSION AND INTERPRETATIONS

Lithic Resource Utilization

All chipped stone tools (Table 21) and a sample of flake debitage (Table 22) were sorted by lithic type to determine preferential usage and differences between debitage and finished tools.

The unmodified flake sample consists of the debitage from all levels in A40-17 and 54-11. These squares were selected because of their depth and density of flake debitage. Table 22 indicates that all flake debitage is derived from locally available sources. In general, the order of dominant lithic types and proportions are similar for both squares. The dominant types are Type A, Type H, Type J, Type B, and Type E. The order of Types D, F, G and C varies between the two squares, but occur in small quantities (1.2 and 2.2%). These differences are not believed to be significant. The same general relationships exist with depth even though frequencies vary between levels. The flake debitage suggests that the same general lithic resources were exploited by the various occupants through time.

The chipped stone tool sample includes all implements from the surface and excavation units (Table 21). This sample has been divided into finished implements consisting of points *(01-00)* and drills *(02-00)* and reduction sequence items which include bifaces *(10-00)*, fragmentary bifaces *(12-00)*, split/tested cobbles *(15-00)*, and modified flakes *(13-00)*. This distinction was made in an effort to discern locally manufactured items from finished items which may have been carried to the site. Although the sample is small and may be subject to sampling biases, similar relationships exist between finished and unfinished items. The dominant lithic types for finished tools are Type A, Type B, Type H, and Type J with a small amount of Type E. The dominant types for the reduction sequence items are Type A, Type B, Type J, and Type H with small amounts of Types G, E, D, and F. The reversed percentages of Types J and H between finished and unfinished tools are not considered to be significant since the proportions are close. These data suggest no major differences in the source of lithic material between finished and unfinished tools.

The contrast of lithic types between implements and flake debitage reveals that in most instances the sequence of dominant types vary, but the proportions are similar (Tables 21 and 22). The proportional differences between Type C (0.0 and 0.1%), Type D (1.2 and 0.4%), Type E (2.4 and 1.3%), Type F (1.2 and 0.3%), Type G (2.4 and 0.8%), Type H (11.4 and 13.9%) and Type J (12.6 and 9.8%) are not considered to be significant in light of the small sample of tools. The greatest difference is apparent between Types A and B. Type A has a relatively low tool (52.1) to high flake (67.0) percentage, and Type B has a relatively high tool (16.8) to low flake (5.7) percentage. A combination of two situations could potentially explain the results obtained. Either some tools made of Type A materials at 34Pu-71 were carried to other localities or

Table 21. Lithic type frequencies for selected chipped stone artifacts from 34Pu-71.

Artifact Variety	Lithic Type A	B	C	D	E	F	G	H	I	J	K	Total
01-01-01A	5	1	-	-	-	-	-	2	-	1	-	9
01-01-02A	1	-	-	-	-	-	-	-	-	-	-	1
01-01-02E	1	-	-	-	-	-	-	-	-	-	-	1
01-01-02J	1	1	-	-	-	-	-	-	-	-	-	2
01-01-02L	1	-	-	-	1	-	-	-	-	-	-	2
01-01-04D	1	1	-	-	-	-	-	-	-	-	-	2
01-01-05A	-	-	-	-	-	-	-	1	-	-	-	1
01-01-06C	-	1	-	-	-	-	-	-	-	-	-	1
01-02-01A	1	-	-	-	-	-	-	-	-	1	-	2
01-02-02A	-	1	-	-	-	-	-	-	-	-	-	1
01-10-01A	6	1	-	1	-	-	-	-	-	2	-	10
01-10-02A	30	6	-	-	-	2	-	3	-	7	-	48
01-10-03A	17	4	-	-	-	-	1	3	-	4	-	19
01-10-04A	1	-	-	-	1	-	-	-	-	-	-	2
01-10-05A	2	2	-	-	1	-	1	2	-	-	-	8
01-12-01A	7	8	-	1	1	-	2	7	-	3	-	39
01-13-01B	8	1	-	-	-	-	-	1	-	-	-	10
01-15-01A	2	1	-	-	-	-	-	-	-	-	-	3
01-15-02A	3	-	-	-	-	-	-	-	-	-	-	6
Total	87	28	-	2	4	2	4	19	-	21	-	167
%	52.1	16.8	-	1.2	2.4	1.2	2.4	11.4	-	12.6	-	100.1

Table 22. Vertical distribution of lithic debitage by material type from two squares at 34Pu-71.

Provenience (Square:Level) (10 cm)	Lithic Type											
	A	B	C	D	E	F	G	H	I	J	K	Total
A40-17												
1	156	15	-	-	-	2	2	47	-	37	-	259
2	160	19	1	3	1	1	-	32	-	40	-	257
3	104	5	-	1	3	-	-	20	-	12	-	145
4	83	4	-	-	-	-	-	17	-	7	-	111
5	13	-	-	-	-	-	-	5	-	-	-	18
6	40	2	-	-	-	-	-	7	-	-	-	49
7	2	-	-	-	-	-	-	-	-	-	-	2
F78-2	7	-	-	-	-	-	-	1	-	-	-	8
Floor Scrapings	2	-	-	-	-	-	-	-	-	-	-	2
Subtotal	567	45	1	4	4	3	2	129	-	96	-	851
%	66.6	5.3	.1	.5	.5	.4	.2	15.2	-	11.3	-	100.1
A54-11												
1	181	14	-	-	9	1	9	42	-	20	-	276
2	121	7	-	-	2	-	-	4	-	15	-	149
3	24	9	-	-	2	-	-	8	-	9	-	52
4	9	2	-	1	-	-	-	4	-	2	-	18
Subtotal	335	32	-	1	13	1	9	58	-	46	-	495
%	67.7	6.5	-	.2	2.6	.2	1.8	11.7	-	9.3	-	100
Total	902	77	1	5	17	4	11	187	-	142	-	1346
%	67.0	5.7	.1	.4	1.3	.3	.8	13.9	-	10.5	-	100

some tools made of Type B chert were initally manufactured elsewhere. In addition, the small sample of tools may have biased the differences between the chert types to some extent.

Intrasite Analyses

Analysis of materials from 34Pu-71 is hampered by the scarcity of diagnostic tools recovered during 1978. Out of 202 complete and fragmentary implements, only 23 identifiable points, drills, and prehistoric sherds were found, and four of these came from the surface. The recognition and identification of components is based on the horizontal and vertical distribution of undiagnostic tool fragments and debitage as well as identifiable tools. The isolation of components, range of activity sets, and general site function will be discussed together by correlating assemblages and features with the recognized stratigraphic units.

ANALYTICAL CONSIDERATIONS

The depth and density of cultural materials is not uniform across the site. Ten of the twelve randomly selected squares (A1-3, 2-13, 6-10, 8-3, 10-24, 12-13,17-15, 22-13, 51-24, and 43-10) were along the lower terrace slopes or in an area of depressed relief along the terrace crest (Fig.19). Culturally sterile deposits were encountered between 20-40 cm, with an average depth of 27 cm below surface in these squares. In contrast, the other squares on the terrace crest had cultural materials extending from 40-80 cm deep, with an average depth of 65 cm.

Other differences are apparent between the terrace crest and lower slope areas. The squares along the terrace crest contain all of the features, 82.9% of the bifacially chipped stone tools, 84.2% of the flake debitage, the single sherd, 69.2% of the ground and pecked stone tools, but only 36.4% of the historic materials recovered from the excavations. In order to indicate material density, a series of concentration indices (CI) were calculated for each square by dividing the amount of material by the number of excavated levels (Table 23, Fig. 19). The results indicate that the CI for terrace crest squares range from 87.5 to 170.0 items-per-level with an average of 124.8 items. The CI for the terrace slope squares, with the exception of A10-24 which has a CI of 131.3 range from 24.6 to 84.3 items with an average of 58.0 items. This indicates that the terrace crest area not only has a greater depth of cultural deposits and amounts of materials, but also a greater density of materials. These differences may be attributable to a combination of factors including: less intense occupation and more intense erosion; disturbance from livestock along the lower terrace slope; and the presence of formerly active gullies which have cut into the upper terrace crest. Erosion may have removed a significant portion of the deposit and deflated cultural materials in the lower slope areas and within the gullies of the terrace crest. Therefore, analytical emphasis to define

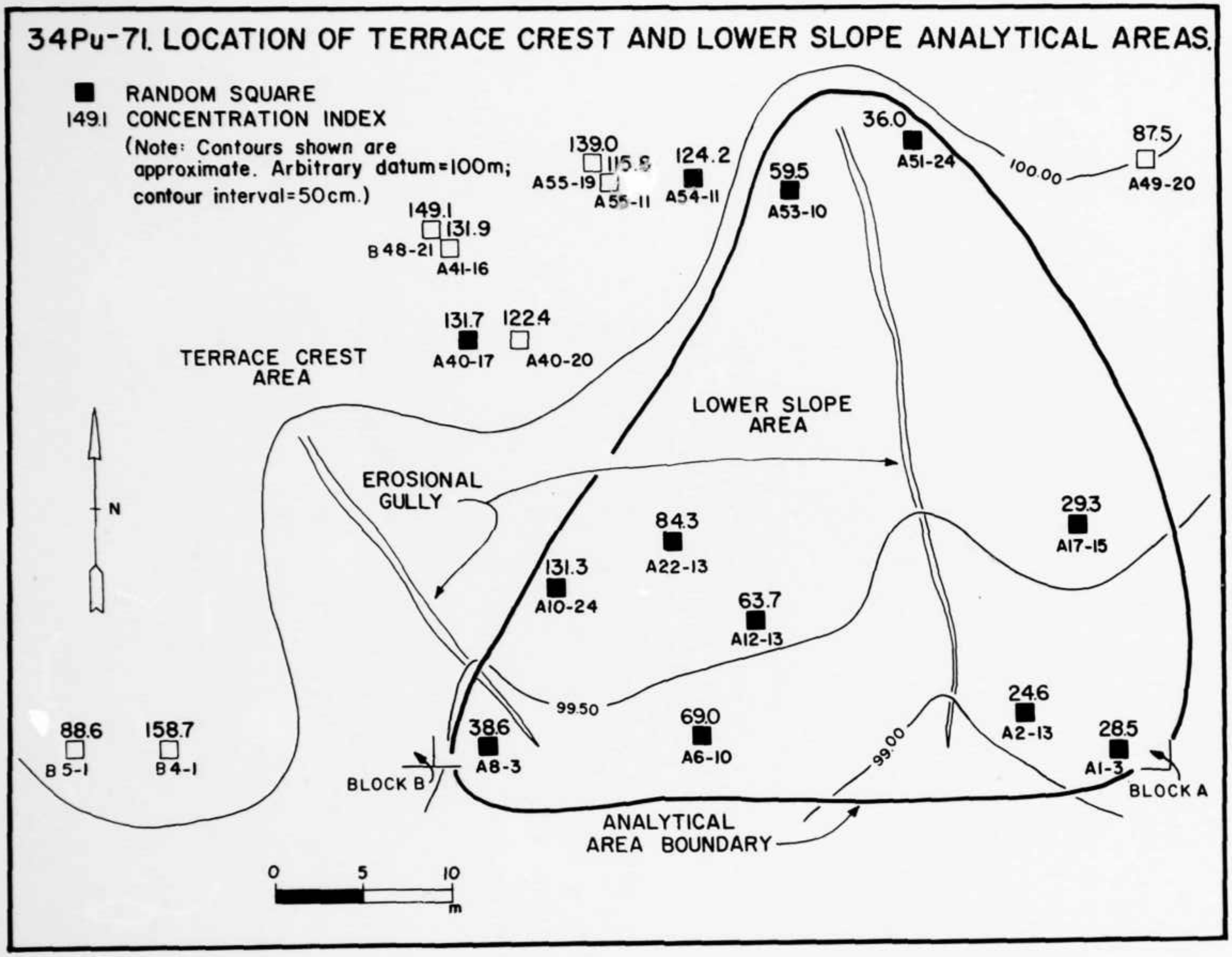


Fig. 19. Concentration indices of debitage and location of terrace crest and lower slope analytical areas at the Natural Lake site (34Pu-71).

Table 23. Concentration indices of artifacts and debitage from 34Pu-71.

Square	Number of Excavated Levels	Number of Tools	Number of Debitage	Total	CI
Terrace Crest					
A40-17	6.5	5	851	856	131.7
A40-20	5.5	19	654	673	122.4
A41-16	7.5	22	967	989	131.9
B48-21	7	16	1028	1044	149.1
A49-20	9	18	770	778	87.5
A54-11	4	2	495	497	124.2
A55-11	6.5	13	740	753	115.8
A55-19	6	8	826	834	139.0
B4-1	7	13	1177	1190	170.0
B5-1	7	8	612	620	88.6
Total	66.0	124	8120	8234	124.8
Lower Slope					
A1-3	2	4	53	57	28.5
A2-13	3	5	69	74	24.6
A6-10	2	3	135	138	69.0
A8-3	3	2	114	116	38.6
A10-24	3	9	385	394	131.3
A12-13	4	5	250	255	63.7
A17-15	3	6	82	88	29.3
A22-13	3	1	252	253	84.3
A51-24	2	1	71	72	36.0
A53-10	2	10	109	119	59.5
Total	27	46	1520	1566	58.0

the number of components and activities will concentrate on materials from the ten squares from the terrace crest area. The amounts of artifacts from the lower slope, terrace crest areas, and the surface are provided in Table 24.

Terrace Crest Area

Specific squares in the terrace crest area include A40-17, 40-20, 41-16, 49-20, 54-11, 55-11, 55-19, B4-1, 5-1, and 48-21. All squares were excavated to culturally sterile soil. Most tool varieties occur in small numbers. Consequently, the discussion of horizontal and vertical tool distributions must be based on class level tool groupings.

The horizontal distribution of tools within the terrace crest area is provided in Table 25. Most points, bifaces, ground, and pecked stone implements occur throughout the area. However, the greatest density of tool classes occurs in six of the seven squares containing rock features in the northwest portion of Block A. The small point *(01-01-06C)*, potsherd *(02-01-01A)*, most bifaces *(01-10-00)* from the reduction sequence, ground stone *(03-00)*, and pecked stone tools *(04-00)* tend to cluster in Squares A40-17, 40-20, 41-16, 55-11, 55-19, and B48-21. A closer examination of the biface *(01-10-00)* and split and tested cobble *(01-15-00)* classes indicates that most of the early stages in tool manufacturing *(01-10-01A* and *01-15-02A)*, occur in this portion of the site.

Discussion of the vertical component from the terrace crest area is based on the distribution of flake debitage (Table 26) and tools (Table 27). In addition, samples of residue from three levels from the water-screen square (A40-20) have been sorted (Table 28). The residue sorts provide information on materials from the lower portion of Stratum III (30-35 cm), the upper portions of Stratum III associated with rock Feature 78-5 (20-25 cm), and upper Stratum II deposits (5-10 cm).

A series of concentration indices (CI) calculated for flake debitage reveals a unimodal vertical distribution with the greatest density occurring in Level 2 (Table 26). This unimodal sequence is present in most individual squares, but relatively low flake counts were present in Level 4 of A55-19 and Level 5 of A40-17. Both levels contain rock Features 78-1 and 78-3. The low flake counts may reflect either decreased knapping associated with the feature or the decreased volume of soil and flakes surrounding the rocks. Other exceptions to the trend in flake debitage occur in A40-17, 41-16, 54-11, and 55-11 where the greatest density of materials occurs in Level 1 as opposed to Level 2. These data suggest that increased knapping occurred in the upper deposits, but it does not indicate which stages of tool manufacturing are represented.

The vertical distribution of tools and waterscreen residue are probably better indicators of components and activities conducted at the site. By correlating assemblages and features to the defined strata and activities, component differences may be distinguished.

Table 24. Horizontal distribution of cultural remains from 34Pu-71.

Artifact Variety	Surface	Terrace Crest	Lower Slope	Total
01-01-01A	3	5	1	9
01-01-02A	-	1	-	1
01-01-02E	-	-	1	1
01-01-02J	-	2	-	2
01-01-02L	-	2	-	2
01-01-04D	-	2	-	2
01-01-05A	-	1	-	1
01-01-06A	-	1	-	1
01-02-01A	-	1	1	2
01-02-02A	1	-	-	1
01-10-01A	3	6	1	10
01-10-02A	3	40	5	48
01-10-03A	5	10	4	19
01-10-04A	-	2	-	2
01-10-05A	3	5	-	8
01-12-01A	8	22	9	39
01-13-01B	-	-	10	10
01-15-01A	-	3	-	3
01-15-02A	2	4	-	6
02-01-01A	-	1	-	1
03-01-01A	2	1	-	3
03-01-02A	-	1	1	2
03-02-01A	1	1	-	2
03-05-01A	-	1	-	1
03-06-03A	-	1	2	3
03-06-04A	-	1	-	1
04-01-01A	1	-	-	1
04-04-04A	-	1	-	1
04-04-04B	-	2	1	3
07-01-01A	-	-	4	4
07-02-01A	-	1	-	1
07-02-02C	1	-	2	3
07-03-02A	1	-	-	1
07-03-04A	-	1	-	1
07-03-07A	-	-	1	1
07-03-09A	-	3	3	6
Total	35	121	46	202

Table 25. Horizontal distribution of artifacts from the terrace crest area of 34Pu-71.

Artifact Variety	Squares A40-17	A40-20	A41-16	B48-21	A49-20	A54-11	A55-11	A55-19	B4-1	B5-1	Total
01-01-01A	1	1	1					1	1		5
01-01-02A		1									1
01-01-02J			1	1							2
01-01-02L									1	1	2
01-01-04D					1				1		2
01-01-05A									1		1
01-01-06C			1								1
01-02-01A					1						1
01-10-01A	1		3					1		1	6
01-10-02A	2	5	5	6	7	1	5	5	2	2	40
01-10-03A		3	1	1	3				2		10
01-10-04A				1	1						2
01-10-05A		2					1	1		1	5
01-12-01A		3	3	6	3	1			5	1	22
01-15-01A	1	1	1								3
01-15-02A		2	1		1						4
02-01-01A			1								1
03-01-01A			1								1
03-01-02A					1						1
03-02-01A		1									1
03-05-01A			1								1
03-06-03A							1				1
03-06-04A			1								1
04-04-04A			1								1
04-04-04B							2				2
07-03-04A			1								1
07-03-09A							1			2	3
09-01-01A							3				3
Total	5	19	22	16	18	2	13	8	13	8	124

Table 26. Vertical distribution of lithic debitage from 34Pu-71.

	Artibrary Levels (10 cm)										
Area:Square	1	2	3	4	5	6	7	8	9	Code 4	Total
Terrace Crest Area:											
A40-17	259	257	145	111	18	49	2*			10	851
A40-20	200	267	102	49	33	3*					654
A41-16	262	249	169	122	88	42	29	6*			967
B48-21	262	352	153	124	71	57	9				1,028
A49-20	142	197	145	93	78	39	41	22	1	4	770
A54-11	276	149	52	18							495
A55-11	290	249	95	67	19	16	1*			3	740
A55-19	260	284	132	27	59	52	21				826
B4-1	264	400	251	132	95	31	4				1,177
B5-1	145	229	125	58	39	16					612
Sub-total	2,360	2,633	1,369	801	500	305	107	28	1	17	8,120
Number of Levels Excavated	10	10	10	10	9.0	8.5	6.0	1.5	1		
CI	236.0	263.3	136.9	80.1	55.6	35.9	17.8	18.6	1.0		
Lower Slope Area:											
A1-3	37	16									53
A2-13	14	45	10								69
A6-10	103	32									135
A8-3	48	54	12								114
A10-24	281	96	8								385
A12-13	47	125	68	10							250
A17-15	49	25	8								82
A22-13	101	151									252
A51-24	39	32									71
A53-10	77	32									109
Sub-total	796	608	106	10							1,520
Number of Levels Excavated	10	10	6	1							
CI	79.6	60.8	21.2	10.0							
Surface										105	105
Total	3,156	3,241	1,475	811	500	305	107	28	1	122	9,745

* indicates half levels

Table 27. Vertical distribution of artifacts from 34Pu-71.

Artifact Variety	1	2	3	4	5	6	7	8	9	Total
	Arbitrary Levels (10 cm)									
Terrace Crest Area:										
01-01-01A	2	2		1						1
01-01-02A					1					1
01-01-02J	1				1					2
01-01-02L		1			1					2
01-01-04D	1						1			2
01-01-05A			1							1
01-01-06C				1						1
01-02-01A						1				1
01-10-01A	1			2	1	2				6
01-10-02A	8	10	3	11	3	3	2			40
01-10-03A	4	4	1		1					10
01-10-04A			1	1						2
01-10-05A	1	2	1	1						5
01-12-01A	9	8	2	2	1					22
01-15-01A	1	1	1							3
01-15-02A		1		1	1	1				4
02-01-01A		1								1
03-01-01A					1					1
03-01-02A		1								1
03-02-01A					1					1
03-05-01A				1						1
03-06-03A	1									1
03-06-04A		1								1
04-04-04A						1				1
04-04-04B		2								2
07-03-04A		1								1
07-03-09A	2	1								3
09-01-01A	3									3
Total	34	36	10	21	12	8	3			124
Number of Levels Excavated	10	10	10	10	9	8.5	6	1.5	1	
CI	3.4	3.6	1.0	2.1	1.3	.9	.5	.0	.0	
Lower Slope Area:										
01-01-01A	1									1
01-01-02E		1								1
01-02-01A	1									1
01-10-01A	1									1
01-10-02A	4	1								5
01-10-03A	2	1	1							4
01-12-01A	5	4								9
01-13-01B	5	5								10
03-01-02A	1									1
03-06-03A	1	1								2
04-04-04B	1									1
07-01-01A	2	2								4
07-02-02C	2									2
07-03-07A	1									1
07-03-09A	3									3
Total	30	15	1							46
Number of Levels Excavated	10	10	6	1						
CI	3.0	1.5	.2	.0						

Table 28. Counts and weights of waterscreen sorts from selected arbitrary levels from square A40-20 at 34Pu-71.

	Arbitrary Levels (5 cm)		
Material	2	5	7
Sample Wt.	500g	500g	500g
Gravel Wt.	483.3g	484.9g	491.5g
Flakes Ct./Wt.	286/11.7g	225/8.4g	189/3.7g
$\bar{x}$ Flake Wt.	.041	.037	.096
Charcoal Wt.	0.3g	0.5g	0.4g
Nutchell Wt.	-	-	-
Seeds/Seed Parts Ct./Wt.	45/0.4g	7/<0.1g	3/<0.1g
Miscellaneous	4.3	6.2	4.2
Stratigraphic Unit	II	III	III
Feature	-	78-5	-

Wt. = Weight
Ct. = Count

Artifacts associated with the lower portion of Stratum III (Levels 5-7) include large expanding stemmed/corner-notched *(01-01-02)* and straight stemmed points *(01-01-04)*, a drill modified from a large corner-notched point *(01-02-01)*, bifaces *(01-10-00)* from all stages of the reduction sequence, manos *(03-01-00)*, and metates/grinding slabs *(03-02-01A)*. The presence of these point forms without small points or ceramics suggest a Middle or Late Archaic component. The waterscreen residue sorts (Table 28) reveal the presence of charred nuts, and slightly larger flakes as indicated by the relatively higher average flake weight (.096 g).

The presence of charred nuts, manos, and grinding slabs suggests processing of floral resources. Larger flakes from the waterscreen residue along with most of the early stages from biface tool production *(01-10-01A)* and tested cobbles *(01-10-02A)* indicate the local procurement of nodules and initial manufacturing of tools. The large points may have served as cutting implements for the processing of floral or faunal resources. An Archaic base camp is postulated for the lower portion of Stratum III.

Rock features are most commonly associated with the upper portions of Stratum III (Level 4) in the northwest corner of Block A. These features suggest a change in activities, which is also reflected in changes in the artifact inventory and waterscreen residue sorts. The earliest occurrence of large contracting stemmed points *(01-10-01A)* and small points *(01-01-06C)* are associated with the rock features. The other chipped stone implements include bifaces *(01-10-00)* from both early and late stages in the manufacturing sequence. A fragmentary ground slate gorget *(03-05-01A)* is also associated with these features. The small sample of tools make the changes in tool inventory difficult to interpret. Most items in the assemblage resemble Late Archaic materials. However, the Agee point *(01-01-06C)* is an early Caddoan form (Perino 1968: 4). This point may be intrusive since other possible early Caddoan materials are scarce and occur in overlying deposits.

The nature of activities associated with the rock features is uncertain. None of the rocks appear to be thermally altered, and the waterscreen residue sorts reveal a decrease in the amount of charcoal from the previous levels. The absence of grinding implements suggests that floral resources were not processed in association with the feature. The scarcity of other diagnostic tools hampers functional interpretations of the rock feature. Both early and late stages in the biface manufacturing sequence are present. The average flake size is smaller than the lower level materials as indicated by a decrease in the average flake weight from the waterscreen residue sorts.

Many artifact types associated with Stratum II (Levels 2 and 3) are similar to those found in Stratum III, but some differences are also apparent. The same large contracting stemmed *(01-01-01A)* and expanding stemmed/corner-notched *(01-01-02)* point forms in Stratum II have been found in Stratum III. The presence of an Early Archaic, Dalton *(01-01-05A)* point from Stratum II probably reflects artifact reuse, since other diagnostic artifacts reflect styles of a considerably later time period. Bifaces from the reduction sequence are plentiful, but most reflect later stages of tool

manufacturing *(01-10-02A, 01-10-03A, 01-10-04A*, and *01-10-05A)*. Later stages of manufacturing are also indicated by the large quantity of flakes recovered from the squares and the relatively small size of flakes from the waterscreen residue sorts as reflected by an average flake weight of only .041 g. A single potsherd *(02-01-01A)* from Level 2 may indicate an ephemeral Woodland or Caddoan component. However, the bulk of materials suggest a Late Archaic component since pottery and small points are scarce from the assemblage. Ground stone implements are represented by a mano *(03-01-02A)* and a smooth pebble *(03-06-04A)*. The fence staple *(07-03-04A)* and small pieces of iron scraps *(07-03-09A)* indicate some historic materials are present in the upper portion of Stratum II.

The activities associated with Stratum II reflect plant processing, stone tool manufacturing and maintenance, and faunal processing.

All artifacts associated with Stratum I (Level 1) have similar forms occurring in lower strata. The points are represented by large contracting stemmed *(01-01-01A)* and straight stemmed *(01-01-04D)* forms, but no small points are present in the uppermost levels. Most chipped stone materials reflect late stages in the reduction sequence and appear to be a continuation of the previously established pattern. No ceramics occur in the uppermost level, and ground stone is represented by a single problematical item. Scraps of metal are the only historical materials found near the surface. The pieces of asphalt may have been used by either historic or prehistoric groups (Anonymous 1972). Previous cultivation may have mixed materials in Stratum I deposits in the terrace crest area.

In summary, most materials from the terrace crest area represent Archaic occupations. The Dalton point *(01-01-05A)* is in a context suggestive of artifact reuse, and no Early Archaic component is believed to be present at 34Pu-71. A single potsherd and small point may reflect a later occupation, which may have been either a specialized activity, short term (ephemeral) occupation, or the major area of occupation is beyond the portion sampled during the 1978 season. Historic materials are scarce but consistent with late historic utilization of the site.

Lower Slope Area

The distribution of flake debitage from the lower slope area is provided in Table 26, while the vertical and horizontal distribution of tools is presented in Tables 27 and 29. Diagnostic materials are scarce and include two large points *(01-01-01A* and *01-01-02E)*, one drill *(01-02-00)*, bifaces from the reduction sequence *(01-10-00)*, and a ground stone mano *(03-01-02A)*. These items duplicate materials from the terrace crest area. Modified flakes *(01-13-01A)*, and several varieties of historic glass *(07-01-00)*, ceramic *(07-02-00)*, and metal artifacts *(07-03-00)* are unique to the lower slope.

No horizontal clusters are apparent from the small sample of prehistoric implements from the lower slope area. However, two clusters of historic

Table 29. Horizontal distribution of artifacts from the lower slope area of 34Pu-71.

Artifact Variety	Squares										Total
	A1-3	A2-13	A6-10	A8-3	A10-24	A12-13	A17-15	A22-13	A51-24	A53-10	
01-01-01A							1				1
01-01-02E	1										1
01-02-01A										1	1
01-10-01A					1						1
01-10-02A		3			1			1			5
01-10-03A		1		1		1				1	4
01-12-01A	2		1	1	2	3					9
01-13-01B		1	2		4	1			1	1	10
03-01-02A					1						1
03-06-03A	1									1	2
04-04-04B										1	1
07-01-01A										4	4
07-02-02C							2				2
07-03-07A										1	1
07-03-09A							3				3
Total	4	5	3	2	9	5	6	1	1	10	46

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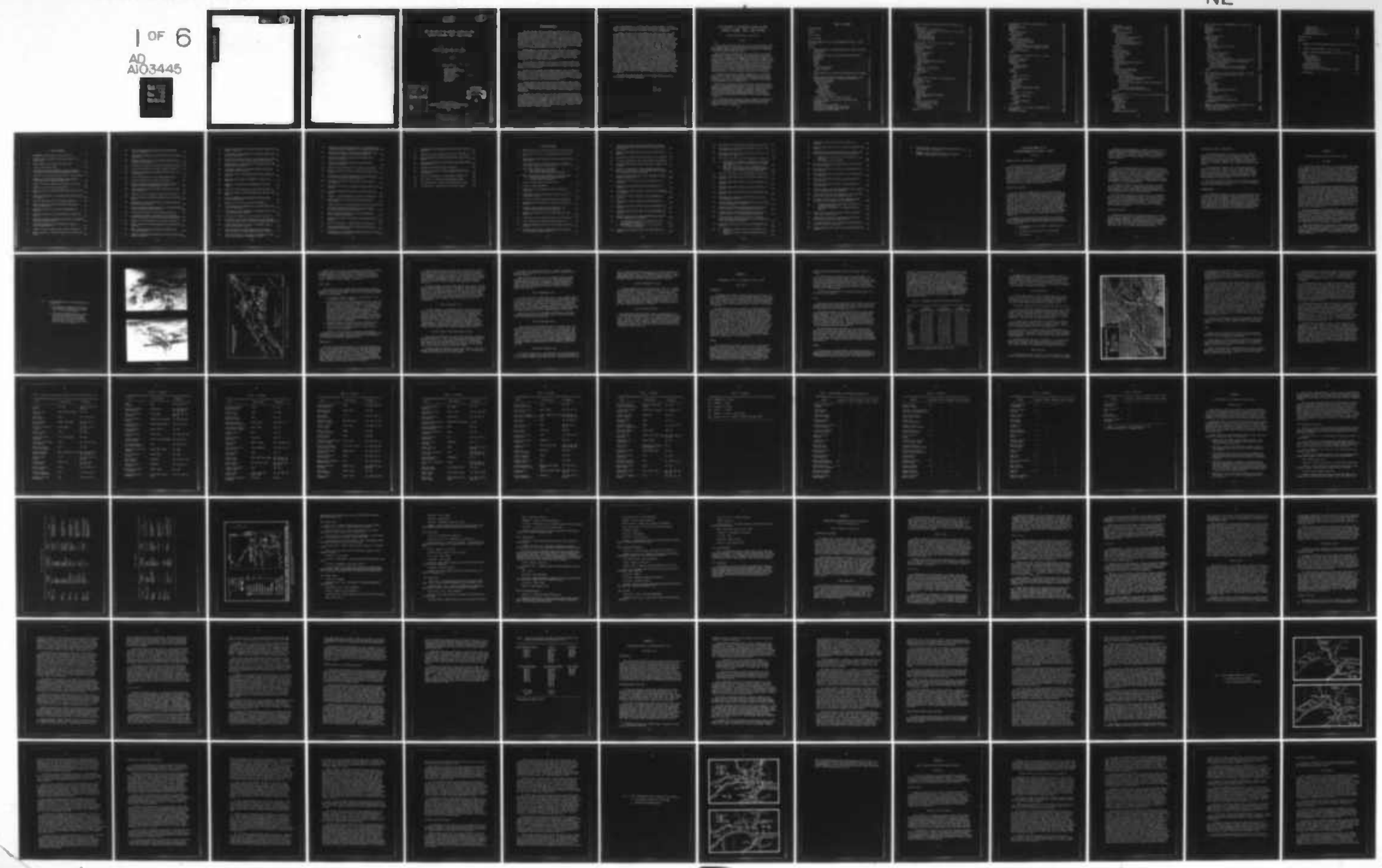

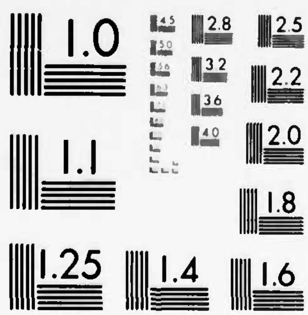
1.0
4.5
5.0
5.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.1
1.8
1.25
1.4
1.6

LEVEL II

3

LEVEL II

3

THE PREHISTORY OF THE PROPOSED CLAYTON LAKE AREA, SOUTHEAST OKLAHOMA: PHASE I INVESTIGATIONS.

10

EDITED BY RAIN VEHIK ~~AND~~ JERRY R. GALM

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Rain Vehik was Project Director for the Clayton Program and Jerry R. Galm served as Principal Investigator

RV

May, 1979

THE PREHISTORY OF THE PROPOSED CLAYTON LAKE AREA, SOUTHEAST OKLAHOMA: PHASE I INVESTIGATIONS

Edited by Rain Vehik and Jerry R. Galm

ABSTRACT

This report describes archaeological field work conducted in southeast Oklahoma (Latimer, Pushmataha, and Pittsburg Counties) between July and September 1978 for the Tulsa District, U.S. Army Corps of Engineers, under Contract Number DACW56-78-C-0212.

Excavations were undertaken at seven sites that will be directly impacted by the completion of Clayton Lake in the Jackfork Creek Valley. These include: 34Lt-32, 34Pu-71, 34Pu-72, 34Pu-73, 34Pu-74, 34Pu-79, and 34Pu-105. An additional site ~~(34Pu-111)~~ was tested in December, 1978 through a contract modification. Excavations, for the most part, involved the development of a random sampling strategy designed to provide intra- and intersite comparability and broad horizontal coverage at each site. In addition, this sampling strategy provided limited data necessary to interpret site chronologies, nature and significance of site occupations, and site functions. Specialized studies including soil analysis, geology/geomorphology, and pollen analyses provide ancillary information.

Analyses of the cultural materials suggest that the site occupations range from Archaic through Caddoan and possibly the Fort Coffee/McCurtain foci. These sites represent special purpose extractive sites, base camps, and a possible Caddoan hamlet. The analyses also revealed broad similarities within and between sites.

Although a chronological sequence has not been developed, several radiometric and archaeomagnetic dates are provided. These include radiocarbon and archaeomagnetic determinations from two structures at 34Pu-74 which are dated between A.D. 970-1250. Radiometric determinations of A.D. 580-601 date a Woodland component at 34Pu-111. Samples from 34Pu-105 date an Archaic/Woodland component between A.D. 302-616 and an earlier determination of A.D. 1100 dates an early Caddoan component at this site.

A preliminary interpretation of cultural systems is presented and tentative interpretations of settlement/subsistence patterns are outlined. An overview of historic adaptations in the project area and immediate vicinity is presented.

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MITIGATION SUMMARY OF THE CLAYTON ARCHAEOLOGICAL PROJECT: PHASE I

Rain Vehik

PURPOSE OF PHASE I INVESTIGATIONS

The Clayton Lake Project Area is in southeast Oklahoma and includes portions of Pushmataha, Latimer, and Pittsburg Counties. The dam axis will cross Jackfork Creek below its confluence with Buffalo Creek. The project is scheduled to be completed by 1982. The present work is part of a two phase program designed to mitigate adverse impacts on at least 39 known archaeological resources in the project area. The mitigation program involves excavations on a minimum of 16 sites which were recommended on the basis of a one month testing program (Bobalik 1977). Part of the contract involved an assessment of historic resources in the project area. This report details the results of the Phase I investigations conducted between July and September 1978.

CONTRACT SPECIFICATIONS

The final contract (DACW56-78-C-0212) agreed upon between the Archaeological Research and Management Center and the U. S. Army Corps of Engineers required that a coordinated program of study be developed, that the results be published, and that site materials and records be curated. More specifically, the contract called for an assessment of historic resources in the project area, which is considered in detail in Chapter 5. Also, it required that excavations be conducted to the point of diminishing returns at six sites. One of these, 34Pu-71/72, had been considered a single site, but upon excavation it was determined that these were separate sites and are so considered in this report. The specific sites were 34Lt-32, 34Pu-71, 34Pu-72, 34Pu-73, 34Pu-74, 34Pu-79, 34Pu-105, and 34Pu-111. The last site was added as a contract modification. The results of these investigations are discussed in Chapters 7-14.

In addition to the specifications provided for in the contract, the following research goals were included in this study for the purposes of interpreting and/or developing settlement-subsistence patterns in the project area.

1. The development of a chronological framework of site occupations.

2. The nature and significance of site occupations.

3. Site functions.

These goals were supplemented by a number of specialized studies. These included geological/geomorphological studies (Appendix C), mechanical and chemical analyses of soils (Appendix A), palynological analyses (Appendix B), biological studies, especially potentially usable faunal and floral resources (Chapter 2), and an historic overview (Chapter 5).

LIMITATIONS

Previous investigations, both the survey in 1972 and preliminary testing in 1976, in the project area were restricted due to constraints in time and funding. As a result, Phase I investigations did not provide a reasonable assessment of many of the sites proposed for mitigation. For example, it was not until excavations had been initiated that we discovered that portions of 34Pu-79 had been drastically altered by recent historic disturbances. It was also extremely difficult to develop an adequate mitigation program based on a limited number of posthole tests and 1 m test squares at many sites.

The scheduling of Phase I investigations also posed a problem. Due to a variety of delays, a contract was not approved until July. This resulted in a loss of many qualified personnel who otherwise would have been involved in the project; both at the beginning of the field program and at the start of the academic year.

The last major constraint involved the acquisition of properties on which sites to be mitigated were located. It was not until two weeks into the field program that we learned that four of the original six sites had not been acquired by the Corps and we were unable to gain access to these sites from the landowners. This resulted in having to select four additional sites and set the field program back a minimum of two weeks.

INVESTIGATION RESULTS

Excavations were conducted at eight archaeological sites which will be directly impacted by the completion of Clayton Lake. A historic overview was also completed. The prehistoric sites range from Archaic through Caddoan encampments and possibly through the Fort Coffee/McCurtain foci. These sites reflect approximately 2500 years of human adaptation in the Jackfork Valley and reflect small special purpose camps, base camps, and a probable Caddoan hamlet (34Pu-74).

SIGNIFICANCE OF PHASE I INVESTIGATIONS

As of 1978, approximately 45 prehistoric sites will either be directly or indirectly affected by the completion of Clayton Lake. No preservation of these sites is being planned at present. As a result, there will be little future opportunity to initiate scientific research to investigate inundated sites. Drawdowns and mechanical wave action may destroy a number of sites after the lake has been completed.

Of the eight sites excavated, four are significant enough to warrant additional work. These are 34Lt-32, 34Pu-74, 34Pu-105, and 34Pu-111. Site 34Lt-32 is one of the sites at which permission to continue excavations was denied. The other three will at a minimum provide additional settlement and chronological information. These sites as well as 34Pu-100 and 34Pu-102 are being nominated to the National Register of Historic Places.

The limited excavations at 34Pu-71, 34Pu-72, 34Pu-73, and 34Pu-79 were sufficiently detailed to consider these sites to be investigated "to the point of diminishing returns."

RECOMMENDATIONS

As indicated above, several sites to be investigated during Phase II have been nominated to the National Register of Historic Places. Additional survey is also recommended. The reasons for this are that the original survey was very limited in nature and that large areas of the project area are being stripped of vegetational cover. This would provide an opportunity to better understand prehistoric utilization of the Jackfork Valley. In addition, the development of displays related to the prehistory of the project area and a popular synthesis of the archaeological investigations would be informative for the public.

CHAPTER 1

CLAYTON ARCHAEOLOGICAL PROJECT DESCRIPTION: PHASE I

Rain Vehik

In July 1978, the Tulsa District, U. S. Army Corps of Engineers authorized a contract (No. DACW56-78-C-0212) with the Archaeological Research and Management Center, University of Oklahoma to conduct archaeological investigations in the proposed Clayton Lake area (Fig. 1a and b). This is the second in a series of impoundments designed to provide flood control, recreation, and water supplies for southeast Oklahoma. One of these impoundments, Hugo Lake, has been completed and the third, Tuskahoma Lake, is projected for the future. Upon completion, Clayton Lake will inundate a maximum of 24,690 acres (9992 ha) in the northern part of Pushmataha, southern part of Latimer, and a small part of eastern Pittsburg counties in southeast Oklahoma (Fig. 2).

The 1978 Scope of Work considers these investigations to be Phase I of a two-phase mitigation program at the Clayton Lake project even though earlier archaeological survey and testing programs have been referred to as Phase I and II investigations, respectively (Bobalik 1977; 1978). However, several problems relating to the use of this terminology need to be clarified at this stage of the investigations to avoid future misunderstandings. The initial survey, conducted by Neal (1972), was considered to be a "reconnaissance survey" and not Phase I investigations under that contract. The testing program conducted by Bobalik (1977; 1978) under a subsequent contract was referred to as "limited testing" and not as Phase II investigations. Therefore, the work conducted by Neal (1972) and Bobalik (1977; 1978) should not have been reported as Phase I and II investigations in the project area.

The 1978 archaeological investigations were required as construction of the lake would impact at least 39 known archaeological sites. In addition, the reconnaissance survey and testing program were extremely limited in nature. This has resulted in some serious shortcomings in our knowledge of prehistoric utilization of the project area. Since this area is virtually unknown archaeologically, and because the sites will be impacted by the construction of Clayton Lake, it was necessary that additional testing and excavations be conducted.

These investigations were initiated July 10 and terminated September 22 although additional testing was conducted at one site in December of 1978. The project personnel included: a Principal Investigator, a Project Director, two Assistant Archaeologists, a Field Assistant, a field crew ranging between 14 and 35 people, a Laboratory Manager, and a laboratory crew of four people.

Fig. 1 . Aerial photographs of the proposed Clayton Lake Project Area.

a: Oblique aerial photograph showing the dam axis and general topography of the project area. View is to the northwest.

b: Oblique aerial photograph showing a close-up of dam construction activity and the location of three sites in the proposed reservoir pool. The arrows from left to right identify sites 34Pu-73, 34Pu-74, and 34Pu-111. View is to the north.

a

b

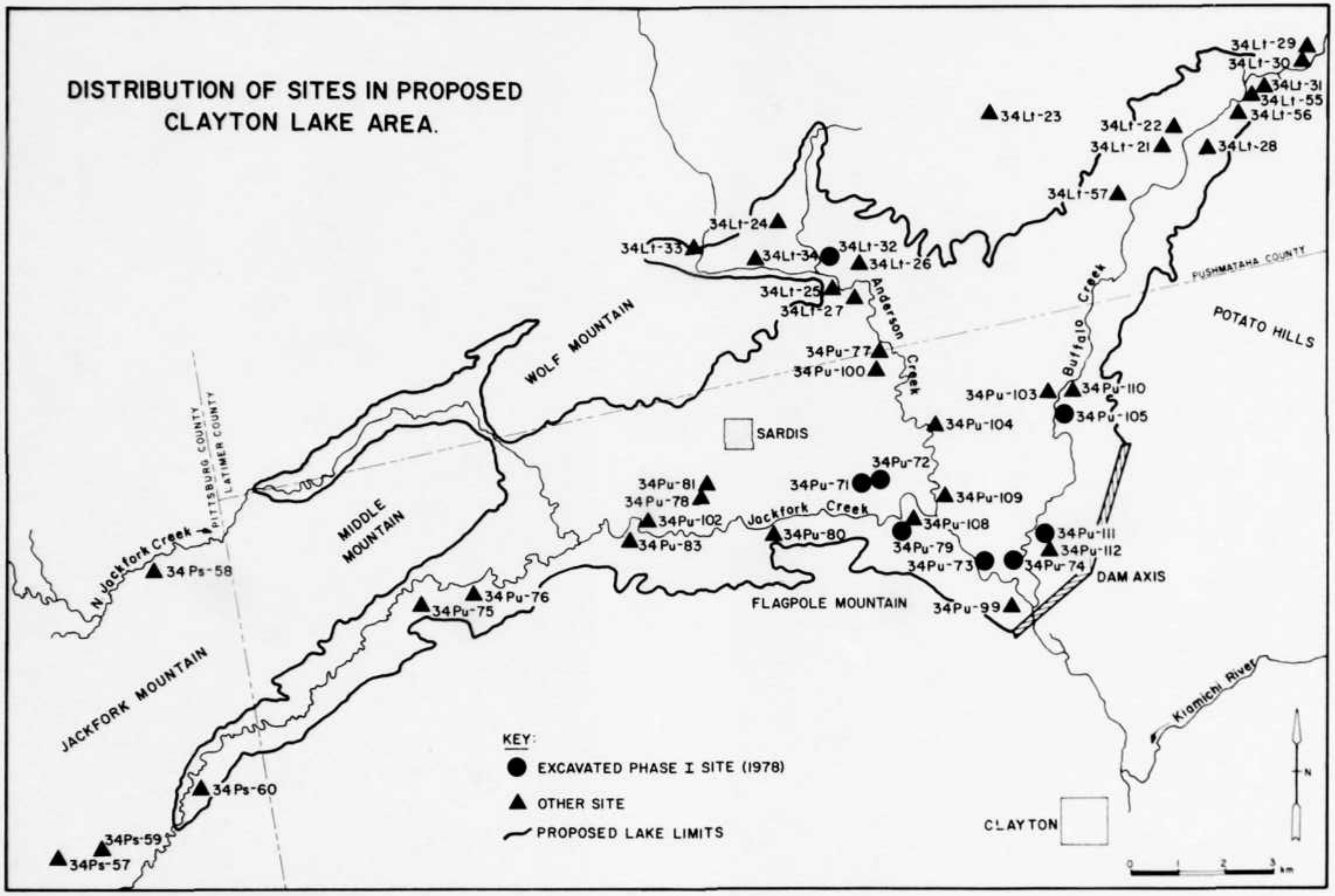

Fig. 2. Distribution of sites in the proposed Clayton Lake Project Area.

Research designs for Phase I investigations were structured to provide information relevant to a preliminary understanding of subsistence-settlement patterns in the project area. The chronological assessment of site occupations and the understanding of the nature and significance of site occupations and site functions were of special concern in this regard. These are discussed in detail in Chapter 6.

SCOPE OF WORK

The contract for Phase I archaeological work entered into by the Archaeological Research and Management Center at the University of Oklahoma and the U.S. Army Corps of Engineers, Tulsa District required that investigations be directed toward:

1. An assessment of historic resources in the project area. This is considered in detail in Chapter 5.
2. Excavations to the point of diminishing returns at six sites. The existing contract was modified in November to include test excavations at a seventh site (34Pu-111). This section (discussed in detail in Chapters 7-14) required that: *(A)* The Contractor shall use standard excavation techniques based on either stratigraphic or arbitrary levels, as he may determine appropriate. *(B)* If feasible, data for the following analyses shall be collected: pH, pollen, soils, Carbon 14, faunal, and flotation. *(C)* The sites shall be mapped, and artifacts collected during the investigation shall be washed, catalogued, and analyzed. *(D)* All sites shall be restored as closely as possible to conditions prior to the initiation of the excavations.
3. Laboratory analyses consisting of procedures and disciplines necessary to prepare a complete, accurate, written report.
4. A draft report to be completed within 336 calendar days from receipt of notice to proceed.

In addition, all cultural materials recovered during the Phase I investigations will be curated by the Stovall Museum (the State depository) at the University of Oklahoma. Essential records will be maintained by the Archaeological Research and Management Center.

PROPOSED SITES

The 1976 field program was dependent on a 30 day testing program consisting of 681 posthole tests at 33 sites and 35 one meter squares at nine sites. One site could not be relocated and two sites were not tested due to major disturbances (Bobalik 1977). This work, in conjunction with the initial survey (Neal 1972), resulted in the development of hypothetical settlement patterns for the Jackfork Basin through time. For the most part, these were determined on the basis of a lithic reduction continuum model and natural features such as reconstructed vegetational zones, water sources, landforms, and elevation (Bobalik 1977: 555-574).

Based on these data, eight base camp sites (34Lt-26, 34Lt-27, 34Lt-32, 34Pu-71/72, 34Pu-100, 34Pu-102, and 34Pu-105) and seven special purpose sites (34Lt-22, 34Lt-31, 34Lt-33, 34Ps-57, 34Pu-75, 34Pu-79, and 34Pu-103) were recommended for further investigation. One additional special purpose site (34Pu-73) was recommended for preservation. These sites were selected because of their chronological placement, natural setting, the type of activities projected, and their relatively undisturbed nature (Bobalik 1977: 575).

As indicated above, the Scope of Work required excavations at six sites which had been acquired by the Corps of Engineers. These included: 34Lt-26, 34Lt-32, 34Ps-57, 34Pu-71/72, 34Pu-74, and 34Pu-103. Work was initiated at 34Lt-32 but it was abruptly terminated when the landowner refused access to properties not yet purchased by the Corps. The same situation was true at three of the other sites. As a result, the contract was altered to incorporate 34Pu-73, 34Pu-79, and 34Pu-105 in addition to 34Pu-71/72 and 34Pu-74. A brief description and summary of these sites as well as 34Pu-111 is provided below.

34Lt-32 (Lee Kirkes Site)

This base campsite is on a prominent terrace at an elevation of 603 feet (183.8 m) at the north end of Anderson Creek. Testing in 1976 consisted of five 1 m squares and 27 post hole tests which indicated that the site covered an approximate area of 100 m by 130 m. Abundant cultural materials extend to a depth of 70 cm and some areas of the site may be over a meter deep. Stratigraphically, the cultural materials are associated with dark brown and light orange-brown sandy loams overlying reddish clays. The site is believed to have been repeatedly occupied and is represented by a possible Archaic component and a Woodland or early Caddoan component. Suggested activities are hunting, vegetal procurement, processing and storage, and lithic reduction (Bobalik 1977: 391-435).

34Pu-71/72 (Natural Lake and Jeff Brown #1 Sites)

These sites were considered as a single linear occupation representing base camps (Bobalik 1977: 237). They are along the same prominent terrace, 575 feet (175.3 m) m.s.l., along the central portion of Jackfork Creek. Even though these sites were considered as a single site in 1976 (Bobalik 1977: 237-281) they are believed to represent temporally distinct occupations and are treated as seperate sites in this report.

The Natural Lake site (34Pu-71) covers an area of 225 m by 100 m and is bounded on the south by a small lake (Natural Lake). Four 1 m squares and 20 post holes constituted the 1976 testing program.

The other site, 34Pu-72 (Jeff Brown #1), is about 150 m further east and covers an approximate area of 100 m by 170 m. Fifteen post hole tests were excavated.

Bobalik (1977) suggests that most of the cultural material at both sites was confined to the upper 50 cm of the deposits, which correspond to light brown and brown sandy loam sediments. The underlying soils consist of orange-colored clay. Woodland/early Caddoan components and possibly an Archaic component were inferred. Suggested activities include hunting, vegetal processing and storage, and lithic reduction (Bobalik 1977: 237-281).

34Pu-73 (Vanderwagen Site)

This site, considered a special purpose site, is on a prominent terrace, 565 feet (172.2 m) m.s.l., along the south part of Jackfork Creek. Based on 17 post hole tests the site area is believed to cover a 75 m by 330 m area. The majority of cultural materials occur in the upper 30 cm of brown loam and tan sandy deposits, but in some areas cultural materials extend to a depth of 50 cm. The underlying sediments consist of an orange-colored clay. The site is thought to be Late Archaic/Woodland in age. Inferred activities are processing, hunting, and lithic reduction (Bobalik 1977: 739-782).

Even though this site was recommended for preservation, additional excavations were necessary since the site locale will be used as a borrow area for the construction of Clayton Lake.

34Pu-74 (Blessingame Site)

This is a base campsite along the south part of Buffalo Creek. It is on a prominent terrace, 575 feet (174.7 m) m.s.l., and covers a 150 m by 200 m area. Two 1 m squares and 19 post hole tests were excavated. Most of the cultural material occurs in the upper 50 cm of a dark brown loam deposit. Underlying this unit are yellow sandy clay and orange clay sediments. A single radiocarbon date (220 ±100 B.P.; UGa-1518), believed to be contaminated by recent organic materials, was obtained from one feature on the north end of the site. The site appears to be multicomponent consisting of an Archaic and Woodland/early Caddoan component. Predominant activities probably included hunting and lithic reduction (Bobalik 1977: 488-516).

34Pu-79 (Jock Standefer Site)

This special purpose site is on a prominent terrace, 575 feet (175.3 m) m.s.l., along the central part of Jackfork Creek. It is south of 34Pu-71/72. The site area is thought to cover 160 m by 225 m. Twenty-two post holes and

four 1 m squares were excavated to test the site. Cultural materials were confined to the upper 30 cm. These sediments consist of a mottled, tan sandy loam overlying orange sandy clay and decomposed sandstone. Archaic and possibly Woodland components are posited. Inferred activities are hunting, processing, and lithic reduction (Bobalik 1977: 282-305).

34Pu-105 (Arrowhead Hill Site)

This base campsite is on a terrace, 575 feet (175 m) m.s.l., adjacent to an oxbow along the central part of Buffalo Creek. The site was tested by 20 posthole tests and three 1 m squares. It is thought to cover a 100 m by 180 m area. A radiocarbon date of A.D. 1100 ±75 (UGa-1519) was obtained from one feature. Most of the cultural material occurs in the upper 40 cm of a brown sandy loam overlying orange and brown clays. The site may be multicomponent. The earlier component is believed to be Late Archaic and the later component is thought to be either early or late Caddoan. Inferred activities are hunting, vegetal processing and storage, and lithic reduction (Bobalik 1977: 517-554).

34Pu-111 (Buffalo Bend Site)

This possible base camp was not part of the original proposal, but limited testing was conducted through a contract modification (Vehik 1979). It is on a terrace, 560 feet (171 m) m.s.l., along the south part of Buffalo Creek. The site is believed to cover an approximate area of 110 m by 90 m. Testing consisted of seven 1 m squares. Cultural materials occur primarily in the upper 40 cm of a dark brown loam deposit. Sterile yellowish brown sediments are the basal soils. The site is believed to be related to the Fourche Maline phase (Vehik 1979).

CHAPTER 2

ENVIRONMENTAL ASPECTS OF THE PROPOSED CLAYTON LAKE AREA

Rain Vehik

INTRODUCTION

The proposed Clayton Lake is the second stage of the Kiamichi River Basin development plan. The first stage, already completed, is Hugo Lake in north-central Choctaw County and the third stage is the proposed Tuskahoma Lake in the northeast portions of Pushmataha County and part of the southwest section of LeFlore County. The primary goals of this development are flood control, water supply, recreation, and the creation of fish and wildlife habitats.

The proposed lake is being constructed in a broad, east-west valley of the Jackfork Creek Basin, in an area previously cleared and used as pasture. It is estimated that approximately 6200 acres (15,320 ha) of this area are improved pastures and meadows, 9500 acres (23,475 ha) are open pasture, and 9250 acres (22,857 ha) are woodlands (Corps of Engineers 1973: 2-11). Upon completion, the lake will inundate 17,740 acres (7179 ha) at the flood control pool level, elevation 607 feet (185 m), in parts of northern Pushmataha, southern Latimer, and western Pittsburg Counties in southeast Oklahoma (Fig. 2). The dam site, approximately 2.8 miles (4.5 km) north of Clayton, will be on Jackfork Creek slightly south of its confluence with Buffalo Creek. Jackfork Creek, the major drainage to be affected, is a tributary of the Kiamichi River and empties into it about 2.5 miles (4 km) south of the dam site. The elevation of the maximum pool is 624 feet (190.2 m) and will cover 24,690 acres (9992 ha). The conservation pool elevation will be 599 feet (182.6 m) and will cover 14,360 acres (5811 ha). At this level the lake will have an irregular shoreline of approximately 117 miles (188.3 km).

GEOLOGY

The project area lies in the west central portion of the Ouachita Mountains structural province and is characterized by rolling hills, mountains, and narrow valleys. The mountains display a maximum intensity of folding and faulting and their stratigraphy in the Kiamichi drainage basin includes formations of Cambrian, Ordovician (Mazarn shale in the Potato Hills and Bigfork chert), Silurian, Devonian (Woodford chert-Arkansas Novaculite), Mississippian (Stanley shale), and Pennsylvanian age (Oklahoma Water Resources Board 1969: 27). The majority of formations in the Ouachitas consist of sandstone and cherty shales. The

latter are important archaeologically and are discussed in detail in Chapter 3.

The project area is in a broad, flat valley (fan-shaped) in the foothills of the Jackfork Mountains (Corps of Engineers 1973: 2-1). This area is drained primarily by Jackfork, Buffalo, and Anderson creeks. These creeks flow through mountainous terrain and generally exhibit trellis drainage patterns before entering the Kiamichi River. Valley bottom materials include fine silts and clays of the floodplain, and channel deposits include pebbles and cobbles, many of which are composed of chert or other usable lithic resources.

A more detailed description of the geology and gemorphology of the project area is in Appendix C.

SOILS

Soils in this region are included in the order Ultisols and the great group Hapludults (Gray and Roozitalab 1976: 28-30). These soils have a low base saturation, are usually moist, and have subsurface horizons with high clay content (Corps of Engineers 1973: 2-3).

The primary soil groups are the Hector-Pottsville and Enders-Conway-Hector associations which are developed from acid shales common to the Ouachita Mountains. The Hector-Pottsville soils are usually thinly developed on mountain sides and often mantle alternating sandstones and shales (Gray and Galloway 1969: 19). They are light colored soils which tend to be medium to strongly acidic. Surface drainage is rapid but subsurface or internal drainage is slow. These soils are highly suitable for oak, hickory, and pine production in addition to being used as range lands (Oklahoma Water Resources Board 1969: 33).

The Enders-Conway-Hector association is also developed from acid shales, but are usually found on gentle slopes and in valley bottoms. These soils range from brown sandy-silt loams on the surface to yellowish- and reddish-brown sandy-silt loams and clay subsoils (Gray and Galloway 1969: 54, Table 1). Areas in which this association occurs are generally well drained on the surface with moderate internal drainage. Oak, hickory, and shortleaf pine occur commonly on these soils (Oklahoma Water Resources Board 1969: 33).

CLIMATE

The project area is characterized by a continental type climate, moderated by seasonal influences of warm, moist, southerly winds, with an average velocity of 11 mph (17 kmph), from the Gulf of Mexico (Means 1969: 9; Oklahoma Water Resources Board 1969: 39). The climate ranges from

semihumid to humid and precipitation falls in largest quantities during the spring and fall of the year. Average annual precipitation is 115.3 cm. During the spring and summer moist winds from the Gulf of Mexico often result in thunderstorms. A change to northerly or westerly winds often causes hotter and drier weather. The winter climate is influenced by alternating polar and tropical air masses resulting in sudden drops in temperature (Oklahoma Water Resources Board 1969: 39). As a result, winters tend to be short and usually mild while summers are characterized by being long and hot, occasionally resulting in drought conditions. Table 1 provides data on ranges of maximum and minimum temperatures and precipitation. Snowfall, usually occurring between December and February makes up about 10.2 cm of the total precipitation. The average temperature is 16.8°C with extremes from -10.6° to 43.3°C. The growing season lasts about 180 days with the first killing frost in November and the last occurring in April.

Table 1. Contemporary climatic data for the project area.[1]

Month	Maximum Temperature Range	Minimum Temperature Range	Normal Precipitation Range
January	5.5° to 14.8°C	-6.1° to -0.2°C	0.6 to 5.5 cm
February	6.8° to 19.6°C	-4.0° to 3.1°C	0.2 to 8.2 cm
March	16.2° to 22.5°C	2.4° to 8.1°C	4.1 to 18.4 cm
April	21.1° to 25.9°C	8.8° to 11.9°C	4.4 to 17.8 cm
May	27.2° to 29.2°C	10.1° to 17.5°C	6.5 to 19.3 cm
June	29.6° to 34.2°C	16.9° to 20.1°C	3.8 to 19.9 cm
July	33.3° to 38.7°C	19.3° to 22.6°C	1.3 to 21.2 cm
August	31.1° to 36.6°C	15.8° to 22.1°C	2.6 to 15.8 cm
September	24.8° to 32.7°C	13.7° to 20.2°C	7.7 to 33.4 cm
October	21.7° to 27.0°C	6.3° to 12.4°C	0.8 to 19.5 cm
November	13.0° to 20.2°C	0.2° to 7.9°C	3.6 to 21.3 cm
December	11.1° to 15.7°C	-3.1° to 4.6°C	2.1 to 25.7 cm

[1]Data derived from Tuskahoma weather station, 1970-1978.

FLORA

The vegetation association of the Ouachita Mountains tends to be fairly complex even though it is usually categorized as a deciduous oak-hickory association (Bruner 1931: 131-142). It is apparent that historic land clearing has affected vegetation to some degree (see Chapter 5). Therefore, in order to obtain a better understanding of floral associations this section is divided into a model of the reconstructed vegetation of the late 1800s and the modern vegetation.

Pre-1900s Vegetation

From field notes and plats of 1895 and 1896 Federal Land Surveys, Bobalik (1977: 8-16) developed a model of the pre-1900s vegetation for the project area (Fig. 3). Individuals interested in techniques of using Federal Land Surveys for reconstructing vegetational models are referred to Bourdo (1956), McMillan (1976), and Bobalik (1977).

Three primary vegetation zones were identified (Bobalik 1977: 9-13).

1. *Prairie*. Relatively large prairie areas occur near the confluence of Buffalo and Jackfork creeks, between Anderson and Buffalo creeks, and in parts of the floodplain and terraces of Jackfork and North Jackfork creeks. Smaller, isolated prairies occur in the floodplains of Jackfork and Buffalo creeks. Prairies constitute approximately 41.4 km^2 of the mapped area. Occasional trees are primarily elm and oak.

2. *Upland Forest*. This zone consists of forested land on mountain tops and slopes bordering Jackfork Basin. This area consists of an oak-pine-hickory association with oak being the dominant species. Upland forests cover approximately 253.8 km^2 of the mapped area.

3. *Lowland Forest*. This area is made up of a predominantly oak-elm-hickory-ash forest on floodplains and low terraces of Jackfork, Buffalo, and Anderson creeks. Common tree species include pine, walnut, sycamore, dogwood, hackberry, and mulberry. Lowland forests occupy about 194.3 km^2 of the mapped area.

The predominant trees (oak, pine, and hickory) in the reconstructed model do not vary greatly from those recorded by early explorers (cf. Nuttall 1821). However, their numbers were probably decreased by the time of the survey because of lumbering and land clearing activities.

Modern Vegetation

As indicated earlier and in Chapter 5, the modern vegetation has been altered by lumbering and land clearing activities. Historically, a number

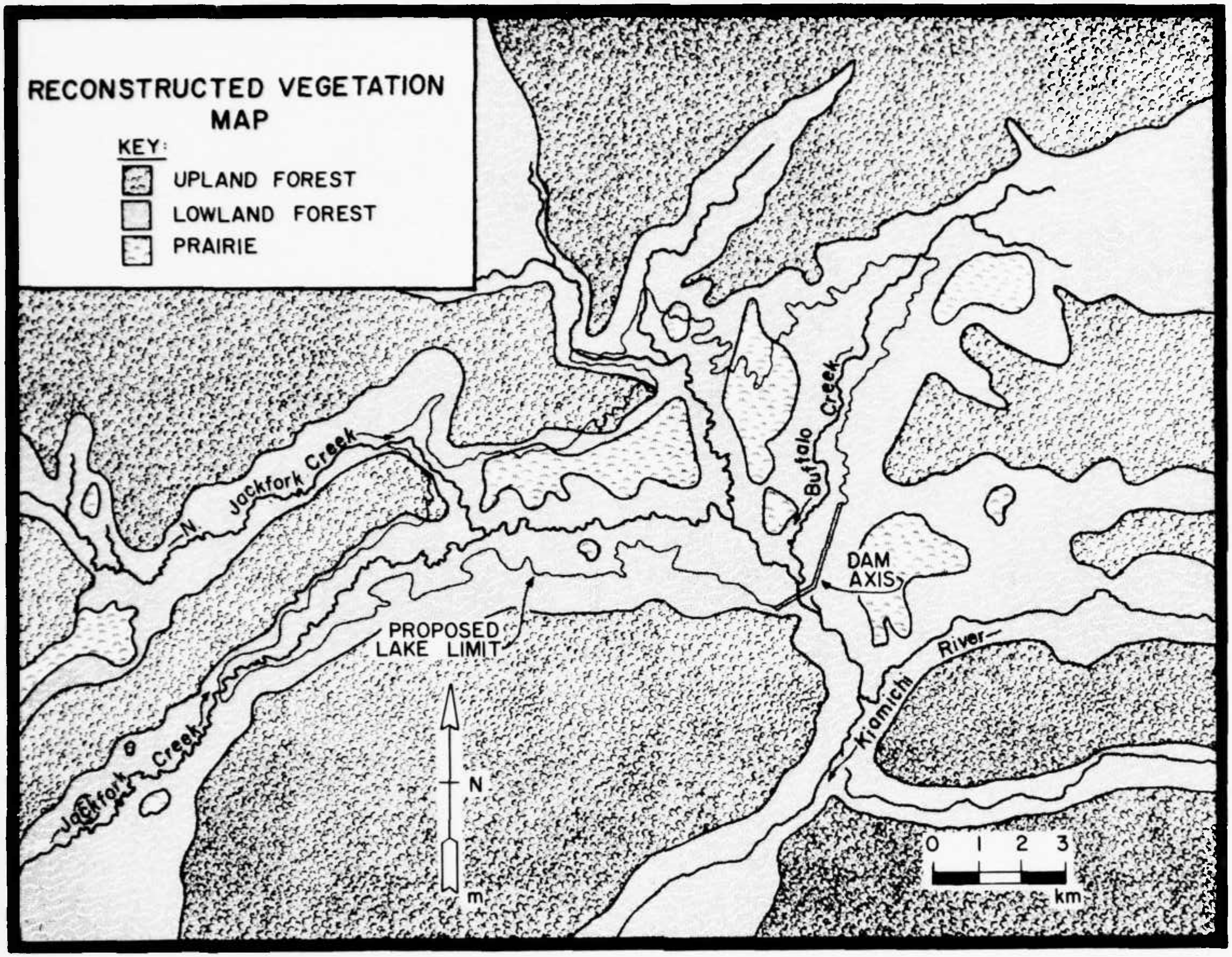

Fig. 3. Vegetation map reconstructed from 1895 and 1896 Federal Land Survey notes.

of individuals have studied the vegetation of the Ouachita Mountains, the most notable being Thomas Nuttall in 1819. The most recent work is that by Means (1969) in which the taxa, habitats, and distribution of arboreal and nonarboreal species in parts of Pushmataha, Latimer, and LeFlore Counties are discussed, including portions of the project area (Corps of Engineers 1973).

In order to discuss the flora of the project area it was divided into three zones: upland forests, lower slope and stream valley forests, and prairies (Corps of Engineers 1973: 2-11, 2-14). Overall, the predominant modern species do not vary greatly from the bearing trees reported by the Federal Land Survey Notes (Bobalik 1977: 10, Table 2). The upland forests contain at least 30 species of trees and shrubs of which black oak *(Quercus velutina)*, post oak *(Quercus stellata)*, black hickory *(Carya texana)*, bitternut hickory *(Carya cordiformis)*, short leaf pine *(Pinus echinata)*, and winged elm *(Ulmus alata)* are the most abundant. Approximately 51 species of trees and shrubs are present in the lower slope and stream valley forests. Water oak *(Quercus nigra)*, southern red oak *(Quercus falcata)*, spotted oak *(Quercus shumardii)*, post oak *(Quercus stellata)*, black hickory *(Carya texana)*, bitternut hickory *(Carya cordiformis)*, nutmeg hickory *(Carya myristicaeformis)*, and water hickory *(Carya aquatica)* are the most common tree species. Seventy-six species of herbaceous flora also occur in the upland and lower slope and stream valley forests. The open prairies contain at least 75 species of which big bluestem *(Andropogon gerardi)*, little bluestem *(Andropogon scoparius)*, switch grass *(Panicum virgatum)*, and Indian grass *(Sorghastrum nutuns)* are the dominant species (Corps of Engineers 1973: 2-11, 2-13).

At least 146 of the plant and tree species recorded for the project area could have been of potential economic importance for prehistoric inhabitants of the area. Table 2 provides a partial listing of these species.

FAUNA

Data for this section were derived from reports by Midcontinent Environmental Center Association (n.d. Chapter 6), Corps of Engineers (1973: 2-15, 30), and from McMillan (1976: 35-41).

Faunal resources in the Jackfork Basin are relatively abundant and at least 49 mammal species are represented (Table 3). The preferred habitat for 59 percent of the species are woodlands (including forest borders and oak-hickory forests).

Many of these species were reported for this area by early travelers and explorers (cf. Nuttall 1821). Archaeologically, at least 13 species have been reported from the Scott and Wann sites in eastern Oklahoma (Bobalik and Galm 1978: 299-332).

Several species which may have been abundant in the past are either rare occurrences today or are being reintroduced. These include black bear *(Ursus americanus)*, elk *(Cervus canadensis)*, American bison *(Bison bison)*, and pronghorn *(Antilocapra americana)*. Long-tailed weasels *(Mustela frenata)* and mountain lions *(Felis concolor)* are also rare occurrences.

The diversity of birds in the Clayton Lake Project Area is great, and at least 224 species have been identified (Corps of Engineers 1973: 2-19, 2-21, Table 2-5). The interested reader is referred to Sutton (1967) for a more complete summation of avian species. Several species may have been of importance archaeologically. Wild turkey *(Meleagris gallopavo)* has been reported from the Wann and Scott sites in eastern Oklahoma as well as other adjacent areas (Bobalik and Galm 1978). Bob-white *(Colinus virginianus)* and Canada goose *(Branta canadensis)* are present at sites in southwest Missouri (Parmalee, McMillan, and King 1976: 145-156, Table 9.3), but have not been identified to date from collections in eastern Oklahoma.

A variety of amphibian and reptilian species are also present (Corps of Engineers 1973: 2-16, 2-18, Table 2-4). Amphibians include seven species of sirens, salamanders, newts, and mud puppies and 14 species of toads and frogs. Reptiles include nine species of skinks and lizards and 24 species of snakes. Of the latter, the copperhead *(Agkistrondon contortrix)*, western cottonmouth *(Agkistrondon piscivorous)*, western diamondback *(Crotalus atrox)*, timber rattler *(Crotalus horridus)*, and western pigmy rattler *(Sistrurus miliarius)* are venomous species. Eleven species of turtle are present in this area. Of these, two species of box turtle *(Terrapene carolina* and *Terrapene ornata)* may have been of economic importance prehistorically.

There have been no systematic studies of aquatic vertebrates or invertebrates in Jackfork Creek or its tributaries. However, a list of probable species present in the Kiamichi River system, including those potentially represented in Jackfork Creek, has been provided by the Corps of Engineers (1973: 2-26, 2-27, Table 2-7). In addition, the Midcontinent Environmental Center Association (n.d. Chapter 6: 12-26, Table 6-2) has provided a listing of fish for the Ouachita biotic provinence and their habitat. By combining these data, 60 of the 87 probable species of the Kiamichi River system occur in tributaries of the river, and possibly in the study area. Only four species of molluscs and one gastropod species have been reported from Jackfork, Buffalo, and Anderson creeks (Corps of Engineers 1973: 2-29, Table 2-8).

Table 2. Partial listing of economic plants in the Clayton Lake Project Area.

Plant	Part Utilized	References
Acer spp. (Maple)	Sap, bark	Sty. 1019, Yan. 41, KWD. 28
Aesculus glabra (Buckeye)	Seeds (after roasting)	Sty. 1022
Allium spp. (Wild onions)	Bulbs	Sty. 428, Yan. 11
Allium canadense (Wild garlic)	Bulbs, entire plant	Sty. 428, Yan. 11, SM 51
Amaranthus retroflexus (Pigweed)	Leaves, seeds	Sty. 623, Yan. 23, Gil. 86
Ambrosia trifida (Horse weed)	Seeds	Sty. 1538
Amelanchier arborea (Shadbrush)	Fruit, leaves (tea)	Sty. 802
Anemonella thalictroides (Rue anemone)	Roots	Sty. 704, Yan. 252
Arisaema atorubens (Jack-in-the-pulpit)	Corm	Sty. 384
Asclepias tuberosa (Butterfly weed)	Shoots, buds, pods, roots	Sty. 1203, Yan. 53, SM. 404, KWD. 70
Asimina triloba (Pawpaw)	Fruits	Sty. 1203, Yan. 26, SM. 146
Astragalus spp. (Ground plum)	Green fruits	Sty. 671, 970; Yan. 26, 36
Bumelia lanuginosa (Chittim-wood)	Fruits	Sty. 1174, Yan. 52
Callirhoe digitata (Fringed poppymallow)	Root	Sty. 1050, Yan. 52
Carpinus caroliniana (Blue beech)	Nuts	Sty. 527, SM. 83

Table 2. Continued

Plant	Part Utilized	References
Carya (Hickory)	Nuts	Sty. 516, Yan. 16
Ceanothus americanus (New Jersey tea)	Leaves (tea)	Sty. 1030, Yan. 41, SM. 308, KWD. 80
Celtis occidentalis (Hackberry)	Fruit, seeds	Sty. 558, Yan. 19, SM. 97
Cercis canadensis (Redbud)	Flowers, fruits (young)	Sty. 878, Mor. 322
Chenopodium album (Lambsquarter)	Shoots, seeds, leaves	Sty. 612, Yan. 22
Commelina diffusa (Day-flower)	Shoots, leaves	Sty. 398
Cirsium altissimum (Thistle)	Stems, roots	Sty. 1622, Mor. 320
Claytonia virginica (Spring beauty)	Roots, corm, young plants	Sty. 636, Yan. 24
Crataegus uniflora (One flower hawthorne)	Fruit	Sty. 804, Yan. 31
Cryptontaenia canadensis (Honewort)	Roots, stems, leaves	Sty. 1300
Cunila origanoides (Dittany)	Leaves (tea)	Sty. 1300
Daucus pusillus (Wild carrot)	Rootstalks	Sty. 1147, Yan. 48
Dentaria laciniata (Toothwort)	Rootstalks	Sty. 751, Yan. 27
Dicliptera brachiata (Diciliptera)	Shoots, leaves	Sty. 1380
Diospyros virginiana (Persimmon)	Fruit, seeds, leaves (tea)	Sty. 1176, Yan. 52

Table 2. Continued

Plant	Part Utilized	References
Echinochloa crusgalli (Barnyard grass)	Seeds	Sty. 234
Eclipta alba (Yerba de Tajo)	Plants	Sty. 1554
Elymus canadensis (Canada wild rye)	Seeds	Sty. 130
Erythronium albidum (White dog tooth violet)	Bulbs, leaves	Sty. 434, Yan. 13
Erythronium americanum (Yellow adder's tongue)	Bulbs, leaves	Sty. 433
Festuca octoflora (Fescue)	Seeds	Sty. 89
Fraxinus americana (White ash)	Inner bark	KWD. 124
Galium aparine (Cleavers)	Shoots, leaves	Sty. 1389, KWD. 126
Gleditsia triacanthos (Honey locust)	Pulp around seeds	Sty. 873, Yan. 36
Helianthus spp. (Sunflower)	Seeds	Yan. 61
Juglans nigra (Black walnut)	Nuts, inner bark, leaves	Sty. 510, Yan. 17, Gil. 74, KWD. 150
Lacuta scariola (Wild lettuce)	Leaves, milky juice	Yan. 62, SM. 528, KWD. 156
Lepidium virginianum (Pepper grass)	Bulbs	Sty. 738
Lindera benzoin (Spice bush)	Fruit, stems, bark, leaves (tea)	Sty. 718, KWD. 160
Liquidambar styraciflua (Sweetgum)	Bark, gum	KWD. 162

Table 2. Continued

Plant	Part Utilized	References
Lithsospermum incisum (Yellow puccoon)	Roots	Sty. 1247, Yan. 54
Monarda fistulosa (Wild bergamot)	Leaves (tea)	Sty. 1291
Morus rubra (Red mulberry)	Fruit	Sty. 562, Yan. 20
Oenothera biennis (Evening primrose)	New seeds, roots	Sty. 1001, Yan. 47
Optunia compressa (Prickly pear)	Fruit, stems	Sty. 1086, Gil. 104
Oxalis violacea (Violet wood sorrel)	Leaves	Sty. 959
Panicum virgatum (Switch grass)	Seeds	Sty. 206
Parthenocissus quinquefolia (Virginia creeper)	Fruit, stalks	Sty. 1034, Yan. 42
Passiflora incarnata (Maypop passion flower)	Fruit, leaves, roots	Sty. 1083, KWD. 188
Pedicularis canadensis (Wood betony)	Shoots, leaves	Sty. 1366, Yan. 57
Phalaris caroliniana (Canary grass)	Seeds	Sty. 188, Gil. 31
Physalis spp. (9 species) (Ground cherry)	Fruit	Sty. 1314, Yan. 56
Phytolacca americana (Pokeweed)	Shoots, fruit	Sty. 630, Yan. 23, KWD. 190
Pilea pumila (Gray clearweed)	Shoots, leaves	Sty. 570
Plantago rugelii (Plantain)	Seeds, leaves	Sty. 1382, KWD. 196

Table 2. Continued

Plant	Part Utilized	References
Platanus occidentalis (Sycamore)	Sap (sugar)	Sty. 790
Podophyllum peltatum (May apple)	Fruits, roots	Sty. 711, KWD. 198
Polanisia dodecandra (Clammy-weed)	Young plants	Sty. 769, Yan. 28
Polygonatum canaliculatum (Solomon's seal)	Rootstalks, leafy shoots	Sty. 442
Polygonum hydropiperoides (Swamp smartweed)	Seeds	KWD. 204
Polygonum pensylvanicum (Pinkweed)	Seeds	Sty. 590
Populus deltoides (Cottonwood)	Bark	Sty. 507, Yan. 16
Potamogeton spp. (Pondweed)	Rootstalks	Sty. 50
Prunella vulgaris (Self-heal)	Plant	Sty. 1279, Yan. 55, KWD. 208
Prunus spp. (5 species) (Wild plum)	Fruit	Sty. 860, Yan. 32, Gil. 87, KWD. 210
Pteridium aguilinum (Bracket fern)	Fiddleheads	Sty. 21
Quercus spp. (13 species) (Oak)	Acorns	Sty. 535, Yan. 18, Gil. 75, KWD. 212
Rhus aromatica (Fragrant sumac)	Fruit (drink), roots	Sty. 1003
Rhus copallina (Dwarf sumac)	Fruit (drink), roots	Sty. 1000, Yan. 40
Rhus glabra (Smooth sumac)	Fruit (drink), roots, leaves	Sty. 1000, Yan. 40, KWD. 214

Table 2. Continued

Plant	Part Utilized	References
Ribes cynosbati (Prickly goose berry)	Fruit	Sty. 785
Robinia pseudo-acadia (Black locust)	Seeds, flowers	Sty. 907, Yan. 39
Rubus spp. (6 species) (Blackberry, raspberry, etc.)	Fruit, leaves (tea), bark root	Sty. 836, Yan. 34, Gil. 84, KWD. 216
Rumex crispu (Curly dock)	Roots	Yan. 20, KWD. 218
Sagittaria latifolia (Duck potato)	Tubers	Sty. 66, Yan. 7, SM. 35
Salix nigra (Black willow)	Buds, bark	KWD. 222
Sambucus canadensis (Elderberry)	Fruit	Sty. 1418, Yan. 58
Sanguinaria canadensis (Bloodroot)	Rootstalks	KWD. 226
Sassafras albidum (Sassafras)	Twigs, leaves, bark	Sty. 717, Yan. 26, SM. 161, KWD. 228
Scripus spp. (Rushes or sedges)	Rootstalks	Sty. 292
Setaria geniculata (Prairie foxtail)	Seeds	Sty. 237
Silphium laciniatum (Compass plant)	Stem	Sty. 1550
Similacina racemosa (False Solomon's seal)	Roots, berries, young shoots	Sty. 452, Yan. 14
Smilax bona-nox (Catbrier)	Rootstalks, young shoots	Sty. 452, Yan. 14, SM. 62
Smilax tamnoides (Bristly greenbrier)	Rootstalks	Sty. 452, Yan. 14, SM. 62

Table 2. Continued

Plant	Part Utilized	References
Solanum carolinense (Carolina horse nettle)	Berries, leaves, rootstalks	Sty. 1312
Solidago missouriensis (Golden rod)	Leaves (tea or greens)	Sty. 1488, Yan. 63
Spiranthes vernalis (Ladies tresses)	Rootstalks	Sty. 480
Sporobolus spp. (Dropseed)	Seeds	Sty. 161
Staphylea trifolia (American bladder-nut)	Seeds	Sty. 1011, Yan. 41
Tephrosia virginiana (Wild sweet pea)	Flower, roots	KWD. 248
Tilia americana (Basswood)	Flowers, sap, fruit, bark	Sty. 1044, Yan. 43, SM. 313
Tradescantia spp. (Spiderwort)	Shoots, leaves	Sty. 392
Typha latifolia (Cat-tail)	Rootstalks, new shoots, seeds, pollen	Yan. 6
Uvularia grandiflora (Bellwort)	Young shoots, roots	Sty. 424
Vaccinius stamineum (Deerberry)	Fruit	Sty. 1162
Vaccinium vacillans (Lowbrush blue berry)	Fruit	Sty. 1164, Yan. 52
Valerianella radiata (Corn salad)	Leaves	Sty. 1421
Viburnum prunifolium (Black haw)	Fruit, bark of root	Sty. 1415, Yan. 58, KWD. 272
Vitis spp. (6 species) (Grape)	Fruit	Sty. 1037, Yan. 42

Table 2. Continued

Sty.	= Steyermark, J. A. (1963)
Yan.	= Yanovsky, E. (1936)
Gil.	= Gilmore, M. R. (1919)
Mor.	= Morton, J. F. (1963)
SM.	= Stemen, T. R. and W. S. Meyers (1937)
KWD.	= Krochmal, A., R. S. Walters, and Richard M. Doughty (1971)

Table 3. Modern mammals in the Clayton Lake Project Area.

Species	Occurrence	Riparian	Woodlands	Prairie	Aquatic
Didelphis marsupialis (Opposum)	C	x	-		
Cryptotis parva (Least shrew)	C		-	x	
Blarina brevicauda (Short-tail shrew)	C	-	x		
Scalopus aquaticus (Eastern mole)	C	-	-	x	
Lasionycteris noctivagans (Silver-haired bat)	R		x		
Pipistrellus subflavus (Eastern pipistrel)	C		x		
Lasiurus borealis (Red bat)	C		x		
Lasiurus cinereus (Hoary bat)	R		x		
Eptesicus fuscus (Big brown bat)	C		x		
Nycticeius humeralis (Evening bat)	C		x		
Plecotus townsendii (Long-eared bat)	R		x		
Dasypus novencinctus (Nine-banded armadillo)	O, C	-	x	-	
Lepus californicus (Black-tailed jackrabbit)	O, C			x	
Sylvilagus floridanus (Eastern cottontail)	C	-	x	-	
Sylvilagus aquaticus (Swamp rabbit)	C	x			

Table 3. Continued

Species	Occurrence	Riparian	Woodlands	Prairie	Aquatic
Tamias striatus (Eastern chipmunk)	O, C		x		
Spermophilus tridecemlineatus (Thirteen-lined ground squirrel)	C		x	-	
Sciurus carolinensis (Eastern gray squirrel)	C	x	-		
Sciurus niger (Eastern fox squirrel)	C	-	x		
Glaucomys volans (Southern flying squirrel)	C	-	x		
Geomys bursarius (Plains pocket gopher)	O, C			x	
Castor canadensis (Beaver)	O, C	-			x
Reithrodontomys fulvescens (Fluvous harvest mouse)	C		-	x	
Peromyscus leucopus (Woodland white-footed mouse)	O	-	x		
Peromyscus maniculatus (Prairie white-footed mouse)	C			x	
Peromyscus boylii (Brush mouse)	C		x		
Peromyscus gossypinus (Cotton mouse)	O, C	x			
Neotoma floridana (Eastern wood rat)	O, C	-	x		
Sigmodon hispidus (Common cotton rat)	C		x	-	
Microtus ochrogaster (Prairie vole)	O		-	x	

Table 3. Continued

Species	Occurrence	Riparian	Woodlands	Prairie	Aquatic
Microtus pinetorum (Pine mouse)	O, C		x		
Ondatra zibethicus (Muskrat)	O, C	-			x
Rattus norvegius (Norway rat)	C				
Mus musculus (House mouse)	C				
Procycon lotor (Raccoon)	C	x	-		
Mustela frenata (Long-tail weasel)	R		x	-	
Mustela vison (Mink)	C	x			-
Spilogale putorius (Spotted skunk)	O		-	x	
Mephitis mephitis (Striped skunk)	C	-	x		
Canis latrans (Coyote)	C		-	x	
Vulpes fulva (Red fox)	O, C		x		
Urocyon cinereoargenteus (Gray fox)	C		x		
Felis concolor (Mountain lion)	R	-	x		
Lynx rufus (Bobcat)	O, C		x		
Odocoileus virginanus (White-tail deer)	C	-	x	-	

Table 3. Continued

Species	Occurrence	Riparian	Woodlands	Prairie	Aquatic
Ursus americanus (Black bear)	R	-	X		
Cervus canadensis (Elk)	R	-	X	-	
Bison bison (American bison)	R			X	
Antilocapra americana (Pronghorn)	R			X	

C = common, O = scattered or local populations, R = rare,
X = preferred habitat, and - = secondary habitat.

CHAPTER 3

LITHIC RESOURCES IN THE PROPOSED CLAYTON LAKE AREA

Christopher Lintz

Identification of lithic source materials in the Ouachita Mountains is difficult even though portions have been intensively studied. A number of Ordovician to Pennsylvanian Period chert and quartzite bearing formations have been geologically identified (Amsden 1961; Briggs 1973; Cline, Hilseweck, and Feray 1959; Fellows 1964; Goldstein and Hendricks 1953; Hendricks, et. al. 1947; Honess 1923; Miller 1955; Roe 1955; Shelburne 1960).

Archaeologists working near the Ouachita Mountains have been interested in identifying lithic types and sources as a basis for developing models of prehistoric resource procurement and exchange patterns. Several studies have described lithic types in terms of minute variations in chert lithology (Bobalik 1977; 1978; Briscoe 1977; Galm 1978a; Keith and Lopez 1978; Lopez and Keith 1976; Mallouf 1976; Penman 1974; Perino and Bennett 1978; Skinner 1957; Wyckoff 1966).

Several problems arise when attempting to classify lithic samples obtained from archaeological sites in the Ouachitas:

1. Numerous chert and quartzite bearing formations occur in the Ouachita Mountains. Many formations have a range of vertical and lateral lithologic variation.

2. Cherts from several different geological formations overlap in such diagnostic characteristics as color, luster, diaphaneity, and inclusions.

3. A large number of chert types recognized by archaeologists for developing procurement models are poorly defined and generally do not correlate to either geological taxonomies or to geological formations.

4. Unlike geological samples, archaeological samples potentially represent a combination of available local and non-local chert types which presumably reflect cultural preferences and practices. The archaeologist must consider the possibility of cultural transport of lithic materials and be aware of local and foreign types in their primary and secondary occurrences.

5. Ambiguity of classification increases inversely to the size of the specimen. That is, the smaller the specimen the harder it is to classify.

The solution to these problems is not easy. Ideally, archaeologically defined lithic types should be correlated with specific geological formations and be rigorously defined. However, descriptions must be based on megascopic attributes since the volume of archaeological materials precludes petrographic analysis.

The lithic sample collected during 1978 was separated into 11 types on the basis of megascopic characteristics such as color, texture, fracture, sheen,diaphaneity, and inclusions (Dana and Ford 1932). In view of the previously mentioned problems, the use of existing geological types is untenable. The lithic source material classification system used in this report combines one or more existing geological/archaeological "types" together if there was considerable overlap in diagnostic attributes. Archaeological synonyms and geological formations are provided in Table 4 . In some cases distributional data were not available for each type. However, what is known for the region is sumarized in Figure 4 . A description of each type follows.

TYPE A (Brown-Blue-Gray Chert)

CORTEX COLOR: Usually colors are honey-yellow, ocher-yellow, yellowish-brown, and cream-yellow, but occasionally range to brownish-red and cherry-red. Cortical weathering discoloration rarely extends more than 5 mm into the material interior.

WEATHERED INTERIOR COLOR: Yellowish-brown, bluish-gray, ash-gray, and chestnut-brown.

FRESH INTERIOR COLOR: Widely varied, but predominately ash-gray, bluish-gray, and chestnut-brown. Mottling frequently combines various colors. Some specimens show a white ring, representing either flaws or inclusions, and other occasionally display milk-white or straw-yellow oolites.

TEXTURE: Aphanitic to very fine grain. This chert type rarely has moderately coarse grains.

FRACTURED SURFACE: Smooth, regular, and even in a conchoidal pattern. However, many specimens have flaws which modify the breakage pattern.

SHEEN: Shiny or waxy to dull.

DIAPHANEITY: Opaque, but not dense. Thin flakes may be translucent.

INCLUSIONS: Minute milk-white or straw-yellow oolites occur in some varieties (Zipper), but inclusions may range from none to abundant.

CONSISTENCY: Many specimens show flaws.

SYNONYMS: Woodford (Banks and Winters 1975; Mallouf 1976), Type A (Bobalik 1977; Galm 1978a),Chickachoc (Penman 1974), Zipper (Bobalik 1977;

Table 4. Lithic Source Material Types

Chert Type	Archaeological Synonyms	Geological Formation/Group	Geological Period	Location
Type A (Brown/Blue chert)	Woodford	Woodford	Mississippian/ Devonian	Ouachita Mountains; primarily north of Jackfork Basin, also local gravels.
	Type A	unknown	--------------	
	Chickachoc	unknown	--------------	
	Latimer I	unknown	--------------	
	Zipper	unknown	--------------	
	Messer	unknown	--------------	
Type B (Black chert)	Battiest	Stanley	Mississippian	Ouachita Mountains; some within Jackfork Basin and local gravels.
	Bigfork	Bigfork	Ordovician	
	Type B	unknown	--------------	
	Jackfork	Jackfork Group	Pennsylvanian	
	Atoka	Atoka Group	Pennsylvanian	
Type C (Green chert)	Kiamichi Green	unknown	--------------	Ouachita Mountains; Northeast of Jackfork Basin, also local gravels.
	Novaculite, Green	Novaculite	Mississippian/ Devonian	
	Bigfork Green	Bigfork	Ordovician	
Type D (Gray chert)	Sallisaw/ Barren Fork?	Sallisaw	Devonian	Northeast Oklahoma (Illinois River); possibly Ouachita Mountains as well as local gravels?
	Gray minor Varieties	unknown	--------------	
	Types A and B	unknown	--------------	
Type E (Novaculite)	Novaculite	Novaculite	Mississippian/ Devonian	Potato Hills; east of Jackfork Basin, also as local gravels.
	Arkansas Novaculite			
Type F (Banded chert)	Schist	unknown	--------------	Uncertain; possibly Ouachita Mountains and gravels in Jackfork Basin.

Table 4. Continued

Chert Type	Archaeological Synonyms	Geological Formation/Group	Geological Period	Location
Type G (Siltstone/Claystone)	Claystone	unknown	--------------	Uncertain; local gravels?
	Siltstone	unknown	--------------	
	Jasper	unknown	--------------	
Type H (Quartzitic Sandstone)	Quartzitic Sandstone Ouachita Quartzite Quartzite	Atoka Group Jackfork Group Stanley Blaylock Womble	Pennsylvanian Mississippian Devonian Silurian	Wide distribution in the Ouachita Mountains; local gravels.
Type 1 (Clear Quartz)	--------------	Stanley	Pennsylvanian	Numerous localities in Ouachita Mountains; local gravels.
Type J (Miscellaneous)	--------------	Uncertain various	--------------	Possible local gravels.
Type K (Non-local)	Florence (Kay Co.)	Barneston	Permian	N. Central Oklahoma; Ark. Basin
	Boone	Reek Springs Keokuk	Mississippian	Ozark Mountains--Ark. Basin
	Alibates	Quartermaster		Texas Panhandle--Ark. Basin

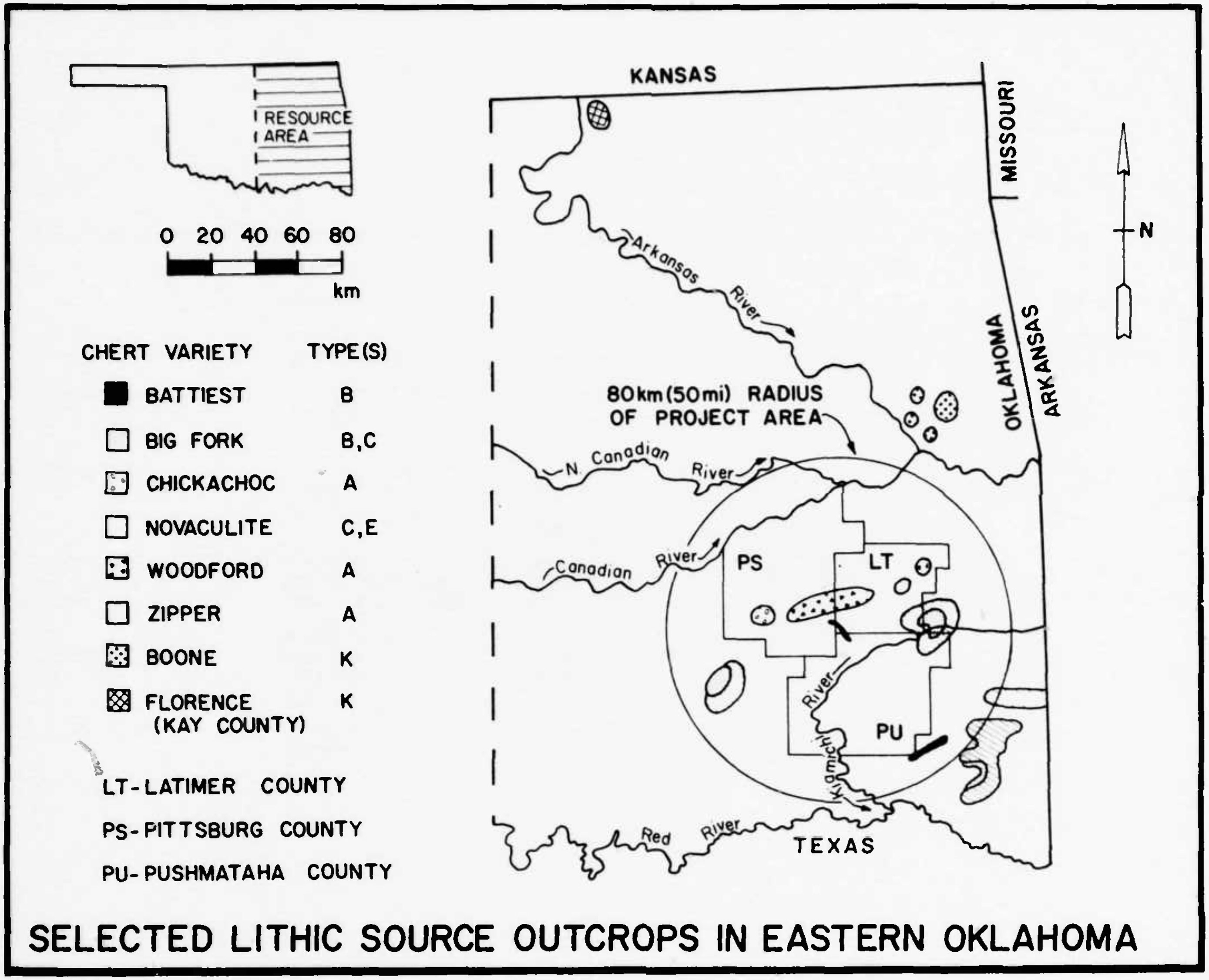

Fig. 4. Lithic source outcrops in eastern Oklahoma with emphasis on the Proposed Clayton Lake Project Area.

Lopez and Keith 1976; Penman 1974), Latimer I (Penman 1974), and Messer (Perino and Bennett 1978).

TYPE B (Black Chert)

CORTEX COLOR: Primarily yellowish-brown but occasionally ranging to columbine-red. The cortex is usually less than 7 mm thick.

WEATHERED INTERIOR COLOR: Occasionally bluish-gray or yellowish-brown, but most often brownish-black or grayish-black.

FRESH INTERIOR COLOR: Grayish-black and velvet-black. Some specimens show a slight banding of bluish-gray or rarely pearl-gray.

TEXTURE: Aphanitic to very fine grained. There is no apparent texture difference between cortical and non-cortical areas.

FRACTURED SURFACE: Smooth, regular, and even breakage in a conchoidal pattern.

SHEEN: Lustrous to shiny on fresh surfaces, but ranges to dull on weathered surfaces.

DIAPHANEITY: Dense, opaque.

INCLUSIONS: Non-diagnostic. Some specimens show extremely small white specks.

CONSISTENCY: Homogenous and generally flawless.

SYNONYMS: Bigfork chert (Bobalik 1977; Mallouf 1976; Wyckoff 1965), Battiest (Honess 1923), Type B (Galm 1978a), Ouachita Black (Keith and Lopez 1978), Jackfork (Keith and Lopez 1978), and Atoka (Keith and Lopez 1978).

TYPE C (Green Chert)

CORTEX COLOR: Unknown

WEATHERED INTERIOR COLOR: Olive-green, to apple-green approaching greenish-white.

FRESH INTERIOR COLOR: Same as weathered.

TEXTURE: Aphanitic to very fine grain.

FRACTURED SURFACE: Smooth, regular, and even with conchoidal fractures.

SHEEN: Waxy to dull.

DIAPHANEITY: Dense, opaque.

INCLUSIONS: Non-diagnostic.

CONSISTENCY: Homogeneous, generally flawless.

SYNONYMS: Kiamichi Green (Lopez and Keith 1976), Novaculite, green variety (Bobalik 1977), and Bigfork, green variety (Mallouf 1976).

TYPE D (Gray Chert)

CORTEX COLOR: Wood-brown to smoke-gray.

WEATHERED INTERIOR COLOR: Smoke-gray to yellowish-gray.

FRESH INTERIOR COLOR: Light to dark ash-gray. A few specimens show subtle mottling or banding, but the majority do not. May overlap Types A and B.

TEXTURE: Aphanitic to fine grain.

FRACTURED SURFACE: Smooth, regular, and even.

SHEEN: Dull, rarely shiny.

DIAPHANEITY: Dense, opaque.

INCLUSIONS: Some examples contain small white dots which give them a coarse textural appearance.

CONSISTENCY: Generally flawless.

SYNONYMS: Gray chert (Mallouf 1976); Sallisaw chert (Banks n.d.); Barren Fork? (Banks n.d.).

TYPE E (Novaculite)

CORTEX COLOR: Light yellowish-brown and light rose-red to indigo-blue. There is seldom a sharp break between cortex and interior color.

WEATHERED INTERIOR COLOR: Various but predominantly grayish-white, pearl-gray, milk-white, light rose-red, but ranges to indigo-blue.

FRESH INTERIOR COLOR: Same as weathered.

TEXTURE: Fine to medium grained, but generally more tenacious than the chert types.

FRACTURED SURFACE: Smooth and even, but can be suppressed conchoidal.

SHEEN: Usually dull to waxy.

DIAPHANEITY: Opaque to slightly translucent.

INCLUSIONS: Non-diagnostic, but occasionally contains tiny black specks.

CONSISTENCY: Varies from clear to highly flawed.

SYNONYMS: Arkansas Novaculite (Keith and Lopez 1978) and Novaculite (Bobalik 1977; Mallouf 1976; Wyckoff 1966).

TYPE F (Banded Chert)

CORTEX COLOR: Deep carmine-red, yellowish-brown, and occasionally broccoli-brown.

WEATHERED INTERIOR COLOR: Bluish-gray, smoke-gray, green-gray to yellowish-gray, but contains same characteristic markings as exterior colors.

FRESH INTERIOR COLOR: Generally light to dark gray, but contains two distinct pattern variations which appear together in some specimens and may have vertical distinctions. One pattern has large circular or flattened grayish-white oolite inclusions on a bluish-gray background; the other pattern contains discontinous bands of wood-brown, greenish-gray, and light and dark smoke-gray colors which blend and interface with one another.

TEXTURE: Medium to fine grain.

FRACTURED SURFACE: Frequently uneven, occasionally smooth but seldom conchoidal.

SHEEN: Dull.

DIAPHANEITY: Dense and opaque.

INCLUSIONS: Large white spots are common in one form, but occasionally the discontinuous banded variety has minute black spots.

CONSISTENCY: Highly flawed.

SYNONYMS: Schist (Bobalik 1977).

TYPE G (Siltstone/Claystone)

CORTEX COLOR: Deep blood-red and brownish-red.

WEATHERED INTERIOR COLOR: Varied, but usually pastel shades of apple-green, wax-yellow, yellowish-brown, brownish-red, ash-gray, and grayish-white. Most specimens have uniform colors.

FRESH INTERIOR COLOR: Same as weathered.

TEXTURE: Fine grain, rarely aphanitic.

FRACTURED SURFACE: Smooth, even, regular, and conchoidal.

SHEEN: Usually dull or flat, and in rare cases may be waxy.

DIAPHANEITY: Opaque.

INCLUSIONS: Non-diagnostic.

CONSISTENCY: Usually flawless.

SYNONYMS: Siltstone (Bobalik 1977), and Claystone (Banks and Winters 1975). Occasionally confused with Jasper.

TYPE H (Quartzitic Sandstone)

CORTEX COLOR: Yellowish-brown, cream-yellow, and brownish-red.

WEATHERED INTERIOR COLOR: Smoke-gray, wood-brown, yellowish-brown, greenish-gray, brownish-red, and occasionally violet-blue.

FRESH INTERIOR COLOR: Same as weathered.

TEXTURE: Medium to coarse grain.

FRACTURED SURFACE: Uneven and irregular depending on grain size.

SHEEN: Dull, although light reflecting off quartz particles gives specimens a sugary appearance.

DIAPHANEITY: Opaque.

INCLUSIONS: Metamorphized quartz sand particles.

CONSISTENCY: Frequently flawless.

SYNONYMS: Quartzitic Sandstone (Galm 1978a), Ouachita Quartzite (Keith and Lopez 1978), and Quartzite (Mallouf 1976).

TYPE I (Quartz)

CORTEX COLOR: Clear to light yellowish-brown.

WEATHERED INTERIOR COLOR: Usually clear, occasionally wax-yellow or smoke-gray.

FRESH INTERIOR COLOR: Same as weathered.

TEXTURE: Aphanitic.

FRACTURED SURFACE: Conchoidal, although internal fractures usually modify the fracture path.

SHEEN: Crystalline surfaces reflect light.

DIAPHANEITY: Transparent to translucent.

INCLUSIONS: None.

CONSISTENCY: Usually flawed.

SYNONYMS: Quartz (Bobalik 1977).

TYPE J (Miscellaneous)

This is a category of cherts and other cryptocrystalline materials that do not conform to any previously defined lithic categories or known non-local chert types. As a category, these specimens display a wide range of diagnostic characteristics. Presumably most of these lithic types represent nodules from local gravel deposits within the Ouachita Mountains.

TYPE K (Non-Local)

This category consists of a variety of cryptocrystalline materials from well-known sources outside the Ouachita Mountain region. Included here are Alibates dolomite from the Texas Panhandle and Canadian River gravels (Shaeffer 1958), Keokuk and Reed Springs varieties of Boone chert from northeast Oklahoma and the Arkansas River Basin (Banks n.d.), and Florence (Kay County) chert from north-central Oklahoma (Banks n.d.; Skinner 1957).

CHAPTER 4

ARCHAEOLOGICAL BACKGROUND AND PREVIOUS INVESTIGATIONS IN THE CLAYTON LAKE AREA

Sheila J. Bobalik and Suzanne Svec

ARCHAEOLOGICAL BACKGROUND

The research area is an interior valley of the Ouachita Mountains and is included in the "Caddoan area" (Davis 1961). This environmentally diverse region includes sections of southwest Arkansas, northeastern Louisiana, northeast Texas, and southeast Oklahoma. The Plains lie west of this area and the Ozark Highlands are to the north. The term "Caddo" refers to a linguistically and culturally related group which inhabitated part of this region during 18th century European explorations. On the other hand, the usage of "Caddoan area" has been employed in the archaeological literature although a relationship between the ethnographic Caddo and prehistoric occupants of the region has not been documented.

There have been no intensive investigations of the interior Ouachita Mountains of southeastern Oklahoma. Therefore, this discussion relies on research conducted along the northern margins of the Ouachita Mountains (Bell 1953, 1972; Newkumet 1940a, 1940b; Brown 1971, 1976; Wyckoff 1974; Galm 1978a, 1978b; Galm and Flynn 1978; Brown, Bell, and Wyckoff 1978), and the southern margins (Rohrbaugh 1968, 1972, 1973; Rohrbaugh, Burton, Burton and Rosewitz 1971; Wyckoff 1967a, 1967b, 1967c, 1968a, 1968b, 1970a). Prehistoric cultural development within the Caddoan area is believed similar to that recorded for much of the southeastern United States. Paleo-Indian, Archaic, Woodland, and Mississippian period designations are commonly used in the southeast area, and will be employed in this overview.

Paleo-Indian Period

The Paleo-Indian or Big Game Hunting period includes hunting and gathering cultures associated with the end of the last major glacial advance. This period is believed to extend from *ca.* 12,000 to 6000-5000 B.C. Evidence of Paleo-Indian groups is generally restricted to "kill" sites where extinct megafauna such as mammoth, mastodon, bison, and other animals are associated with hunting and butchering tools. As a result, our knowledge of the economic and social activities of these peoples is not completely understood.

Large projectile point types such as *Clovis, Folsom, Plainview, Cody,* and *Scottsbluff* have been recovered from sites which date to this period (Leonhardy 1966; Saunders and Penman 1979; Wormington 1957: 23-29; Wheat 1972). Evidence for Paleo-Indian occupations is more common in the present-day tall and short grass prairies west of the Caddoan area. In the Ouachita Mountains, point styles representative of Paleo-Indian sites in other regions have been recovered as isolated surface finds or associated with materials from later periods.

Archaic Period

Archaic populations are believed to have been migratory hunters and gatherers that intensively exploited regionally available resources. This developmental period is believed to evolve out of the Paleo-Indian tradition (Willey 1966: 62). The temporal span varies from region to region and in some areas of the United States a hunting and gathering life-style continued into historic times. Deer, bison, antelope, and numerous small animal along with floral species appear in the archaeological record during this period. In the Eastern Woodlands, the Archaic period has been characterized by an increasingly efficient use of forest-hunting techniques, the establishment of seasonal subsistence rounds, and increased reliance on wild vegetal resources (Caldwell 1958: 71).

Generally, this period is believed to range between *ca.* 8000-6000 B.C. to A.D. 100-200 (Wyckoff 1970a: 82; Galm 1978b), and has been divided into a three part sequence: Early, Middle, and Late. By definition, occupations during the Archaic are preceramic.

EARLY ARCHAIC

Our understanding of the Early Archaic in Oklahoma is hindered by limited investigations and few radiometric dates. The artifact inventory includes a variety of dart points which commonly have ground stems and bases as well as barbed or serrated blades. *Meserve, Dalton, Plainview, Big Sandy, San Patrice, Palmer, Kirk,* and *Searcy* are representative types. Other artifacts associated with these components include a variety of flake scrapers and gravers, occasional ground and pecked stone implements, bifaces, and lithic manufacturing debris. Features are generally restricted to burials and hearths. This period can be correlated with the Pre-Boreal, Boreal, and part of the Atlantic climatic episodes of the Holocene (Wendland 1978: 281).

Only one radiometric determination for this period has been obtained in eastern Oklahoma. A date of 7456 B.C. ±193 (R-1070-4) was obtained on the Early Archaic component at the Packard site, 34My-66 (Wyckoff 1964a). This site is along the Grand River in northeast Oklahoma. Other Early Archaic components have been defined at sites in northeast Oklahoma, but no radiocarbon dates are available.

Early Archaic components are also indicated for several open sites along the southern margins of the Ouachita Mountains in Oklahoma. Multi-component sites from Broken Bow Reservoir include: Bill Hughes (34Mc-21), E. Johnson (34Mc-54), Woods Mound Group (34Mc-104), and Biggham Creek (34Mc-105); Hugo Reservoir: Hill (34Pu-58) and McKensie (34Ch-89); and the Bell site (34Mc-76) in the Pine Creek Reservoir have yielded Early Archaic point types from the deepest portions of their cultural deposits (Wyckoff 1965, 1966, 1967a, 1967b, 1967c, 1968b; Rohrbaugh 1972). However, radiocarbon dates are not available and some mixing with later materials is apparent.

MIDDLE ARCHAIC

Middle Archaic components have been reported from the Grand River area of northeast Oklahoma and from the northern and southern margins of the Ouachita Mountains. Few of these sites have radiocarbon dates. Generally, the Middle Archaic is believed to range from *ca.* 4000 B.C. to 1600-1500 B.C. and is associated with the later portions of the Atlantic and the beginning of the Sub-Boreal climatic episodes (Wendland 1978: 281). This period is characterized by increasing diversity in the cultural inventory, intensification of regional differences, and little indication of exotic goods suggestive of trade. Large straight stemmed and expanding stemmed point forms predominate. Open sites and rock shelters reflect hunting and gathering occupations during this time. The only associated features are hearths, burials, and rock concentrations.

Although Middle Archaic components have been reported for several Arkansas Valley area sites, only two radiocarbon dates have been obtained. The Lawrence site, 34Nw-6 (Baldwin 1969), along the Verdigris River, has yielded dates of 760 B.C. ±70 (Tx-815), 1510 B.C. ±110 (Tx-816), 1140 B.C. ±140 (Tx-817), and 1200 B.C. ±190 (Tx-818). Samples Tx-815 and Tx-817 date rock lined hearths. Large expanding stemmed and straight stemmed points such as *Marshall, Af*[illegible]*, Castroville,* and *Williams* are associated with this component (Baldwi[illegible] 1969).

A date of 1640 B.C. ±175 (Sm-764) from charcoal mixed with a burial has been obtained from the lowest levels of the deposits at Shetley Shelter (34My-77) in northeast Oklahoma (Wyckoff 1964b: 2-3). Large expanding stemmed points and occasional contracting stemmed points were recovered from this site.

From the southern margins of the Ouachita Mountains, Wyckoff (1965, 1966, 1968b) reports Middle Archaic components from the Broken Bow Reservoir have been excavated at the Biggham Creek (34Mc-105), Bill Hughes (34Mc-21), and Callaham (34Mc-68) sites and in the Pine Creek Reservoir at the Bell (34Mc-76) and Gregory (34Mc-9B) sites. Associated assemblages are dominated by large straight stemmed and expanding stemmed points which resemble *Williams, Yarbrough, Palmillas, Dallas,* and *Carrollton* point types.

Evidence for Middle Archaic occupations in the Kiamichi River drainage comes from the Hill (34Pu-58) and McKensie (34Ch-89) sites excavated in the Hugo Reservoir. Rohrbaugh (1972) based this assessment on the presence of *Perdenales, Uvalde, Carrollton, Dallas, Darl,* and *Fairland* point forms.

Additional evidence of Middle Archaic occupations is derived from the Scott site, 34Lf-11 (Galm and Flynn 1978: 118) in the northern Ouachita Mountains. Radiocarbon dates for the lowermost assemblage range from *ca.* 1605 B.C. ±215 (UGa-1976) to 2550 B.C. ±270 (UGa-1970). Straight stemmed point varieties *(Palmillas, Carrollton,* and *Yarbrough)* dominate although a limited number of expanding stemmed and contracting stemmed points are included in the associated assemblage. Forest edge and riverine resource exploitation patterns are suggested by the floral and faunal remains (Galm and Flynn 1978: 160).

LATE ARCHAIC

The Late Archaic (*ca.* 1550 B.C. to A.D. 100-200) is generally viewed as an intensification of the Middle Archaic techno-economic pattern. This pattern involved the exploitation of forest and riverine resources, perhaps as part of a seasonal cycle. The Late Archaic is associated with the later part of the Sub-Boreal and the Sub-Atlantic climatic episodes (Wendland 1978: 281). Late Archaic components are primarily reported from open camp sites. Features are generally restricted to burials, rock concentrations, hearths, and occasional postholes.

Implement forms are often employed in characterizing these occupations since radiocarbon determinations have been infrequently obtained. Expanding stemmed corner-notched varieties are generally the dominant point styles. There has been some controversy surrounding the addition of contracting stemmed points and ceramics to the artifact assemblages.

Numerous sites are reported as representing Late Archaic occupations. The Lamas Branch complex was used by Wyckoff (1967c: 69-89) to group several sites from the southern Ouachita Mountains which indicated Late Archaic components. These sites include Lamas Branch (34Mc-42), Beaver (34Mc-1), E. Johnson (34Mc-54), Woods Mound Group (34Mc-104), and Biggham Creek (34Mc-105) from the Broken Bow Reservoir along with Bell (34Mc-76) and Gregory (34Mc-98) from the Pine Creek Reservoir. Currently, no radiocarbon dates are available to date this complex. Included in the artifact inventory for the Lamas Branch complex are: large points *(Edgewood, Ellis, Marshall, Morhiss, Gary,* and *Langtry)*, stemmed hoes, bifaces, notched cobbles, ground stone gorgets, and numerous pecked and ground stone implements (Wyckoff 1970a: 92-93). Associated floral and faunal remains include deer, freshwater mussels, and hickory nuts.

A Late Archaic component has also been posited for the McKensie site (34Ch-89) in the Hugo Reservoir (Rohrbaugh 1972). The associated assemblage includes numerous large expanding stemmed corner-notched points such as *Edgewood, Lange, Kirk, Marshall* and some contracting stemmed points. A

date of A.D. 60 ±70 (Tx-1483) was obtained from charcoal collected in Level 4 (Rohrbaugh 1973: 217). There is some controversy concerning the date of this Late Archaic component since a limited quantity of ceramics were recovered from this level.

Recent investigations along the northern margins of the Ouachitas have greatly contributed to our understanding of Late Archaic occupations in the forest biome of eastern Oklahoma (Galm 1978a, 1978b; Galm and Flynn 1978). Three sites from the Wister Valley: Scott (34Lf-11), Wann (34Lf-27), and Curtis Lake (34Lf-5A) have similar components which have been tentatively assigned to the Wister phase (Galm and Flynn 1978: 155). The McCutchan-McLaughlin site (34Lf-11) also indicates an occupation during this period in the Wister Valley (Wyckoff 1976; Wyckoff and Woody 1977). Radiocarbon dates from these sites range between *ca.* 1500 B.C.-200 B.C. to A.D. 1. The associated assemblages indicate a predominance of large expanding stemmed corner-notched points (*Lange, Marcos, Williams, Kent, Ellis* and *Edgewood*), drills/perforators, ground stone implements, bifaces, and lithic manufacturing debris (Galm 1978b: 73). The exploitation of forest edge and riverine resources are indicated by the recovery of deer, small mammals, reptiles, fish, freshwater mussels, and *Carya* nutshells. High calcium and phosphorus values and high organic matter content have been interpreted as indicative of intensive food resource processing and/or lengthy occupations (Galm and Flynn 1978: 160-161). The controversy surrounding the introduction of ceramics remains unresolved. Ceramics may have been present as early as 200 B.C. at some locales (Galm and Flynn 1978).

Woodland Period

The Woodland period (*ca.* A.D. 200-500 to A.D. 800-900) is one of the most controversial cultural periods in the Caddoan region. It is associated with portions of the Scandic and Neo-Atlantic climatic episodes. In the Eastern United States, this period has been characterized by the introduction of ceramics, interments placed in burial mounds, construction of earthworks and an elaboration of the associated cultural inventory. The lack of Woodland burial mounds and earthworks in the Caddoan area makes differentiation between Late Archaic and Woodland components quite difficult. As a result, the introduction of ceramics continues to be employed as a convenient marker in identifying Woodland components. At present, there appears to be little change in the Woodland period subsistence-settlement patterns from those observed in the Archaic. Resources from the woodlands continue to be intensively exploited. Evidence from some areas of the Mississippi Valley suggests that the limited cultivation of plants was gradually incorporated into the efficient Archaic subsistence pattern which was based on a seasonal round of hunting and gathering during the Woodland period (Fowler 1971). However, direct evidence of horticulture is lacking in the Caddoan region.

Woodland occupations have not been documented for the southern margins of the Ouachitas. As a result, sites from the northern valleys are pertinent to this discussion (Galm 1978b; Galm and Flynn 1978). Based on recent

investigations, components from several Wister Valley sites are suggestive of the Woodland period (Galm and Flynn 1978: 156). They have been assigned to the Fourche Maline phase (*ca.* A.D. 1 to A.D. 800-1000). Sites with occupations during this phase include Scott (34Lf-11), Wann (34Lf-27), Curtis Lake (34Lf-5A), Kelly Locality (34Lf-5C), Williams I (34Lf-24), and Troy Adams (34Lf-33).

Based on the artifact assemblages associated with these dated components, large contracting stemmed *(Gary)* points and a thick plainware ceramic type *(Williams Plain)* appear to be hallmark artifacts for this phase (Galm 1978b: 74). Except for these items, the artifact assemblage mirrors that associated with the Wister phase components and includes ground stone implements, double-bitted axes, and an occasional stemmed hoe. For this northern valley, the Archaic economic strategy of intensive exploitation of forest edge and riverine resources persists throughout the Fourche Maline phase.

Mississippian Period

The Caddoan tradition is believed to represent a western manifestation of a cultural pattern found throughout much of the Mississippi Valley (Wyckoff 1974: 38).

The temporal dichotomy originally developed (Krieger 1946: 244, 267) for the Caddoan area consists of the Gibson aspect (A.D. 1000-1300) and the Fulton aspect (A.D. 1300-1700). In an attempt to refine the original system a five part sequential scheme was proposed (Davis 1970: 40-56). In this scheme, Caddo I and II are viewed as corresponding to the Gibson aspect while Caddo III is considered to be transitional. Caddo IV and possibly Caddo V are included within the Fulton aspect. Since this five part scheme masks the regional and temporal diversity observed for the Caddoan area, it is not utilized in the present discussion.

For the Arkansas River Valley area, a three phase scheme (Harlan, Spiro, and Fort Coffee) has been developed (Brown, Bell, and Wyckoff 1978). The Harlan phase includes components identified with the Gibson aspect. The Spiro phase exhibits characteristics indicative of either the Gibson or Fulton aspect. The Fort Coffee phase generally corresponds with the old Fulton aspect designation. A three part focus sequence (Hochatown, Sanders, and McCurtain) has also been developed for the Red River Valley subregion. These temporal divisions are generally contemporaneous with the Arkansas Valley phases. In addition, regional variations have been recognized for the Caddoan area during the Mississippian period. These generally correspond to the Arkansas River and Red River Valley areas. Therefore, the two areas will be discussed separately.

ARKANSAS RIVER VALLEY

The Harlan phase (*ca.* A.D. 1000 to A.D. 1200-1250) is characterized by: 1) a reliance on horticulture as well as hunting and gathering, 2) a

variety of site types including mound sites, and off-mound villages, hamlets, and special purpose sites, and 3) the differential treatment of the dead suggestive of a social system involved with status determination (Wyckoff 1974; Brown, Bell, and Wyckoff 1978). The presence of nonlocal resources such as conch shell and copper suggest participation in an extensive trade network. The greatest distribution of Caddoan period sites occurs during this phase. Sites are generally restricted to the oak-hickory forested areas of the Arkansas, Grand, Illinois, Poteau, and Canadian rivers.

Off-mound features include houses, refuse pits, rock lined hearths, and flexed burials rarely accompanied by grave goods. House patterns are square with four interior support posts, a central hearth, and extended entrances. Mortuary structures at Harlan (34Ck-7) are similar but lack interior hearths (Bell 1972). Mound site burials are generally flexed. The artifact inventory at mound sites includes: galena, black stone beads, stone celts, undecorated earspools, ground stone T-shaped pipes, conch shell, copper, small points *(Scallorn* and *Alba)*, a variety of decorated ceramics *(Davis Incised, Holly Fine Engraved, Hickory Engraved,* and *Spiro Engraved)* and plainware *(Williams Plain, LeFlore Plain, Sanders Plain,* and *Woodward Plain)* ceramics (Brown 1971). Since the majority of the exotic materials and elaborately decorated items are concentrated at the mound centers, radiocarbon dates are critical to the identification of Harlan phase off-mound sites. However, very few determinations are available for these sites in eastern Oklahoma.

The subsequent Spiro phase (*ca.* A.O. 1200-1250 to A.D. 1350-1400) is characterized by: 1) continued dependence upon a horticulture and hunting and gathering subsistence strategy, 2) off-mound special purpose and habitation sites and mound sites with structurally differentiated mound classes, 3) participation in an extensive trade network suggested by numerous exotic and elaborately decorated items, and 4) the concentration of these elaborately decorated items at mound sites. The distribution of these sites suggests a contraction of the area when compared with the Harlan phase.

Overall, the artifact inventory from Spiro phase mound sites is more elaborate than that observed from the preceeding phase. These items include: decorated earspools, engraved conch shell dippers, beads, gorgets, elaborate copper items, ground stone T-shaped pipes, stone effigy pipes, and a variety of undecorated *(Woodward Plain, Sanders Plain,* and *Williams Plain)* and decorated *(Sanders Engraved, Poteau Engraved, Friendship Engraved, Nash Neck Banded,* and *Woodward Applique)* ceramic types (Brown 1971, 1976).

Many of these ceramic types and the *Foster*-type earspools indicate interaction with the Red River area. Most of the Spiro phase utilitarian wares are shell tempered. A variety of small corner-notched, side-notched, and unnotched triangular points have been recovered. Spiro phase burials are generally flexed although some are extended. In addition, there is an increase in the evidence of mound site mass burials with numerous grave goods.

Houses are generally square with four center posts, central hearths, and extended entryways. However, smaller rectangular houses with two interior support posts have been reported. These structures may or may not

exhibit extended entrances and central hearths. Refuse pits are also present at off-mound sites (Wyckoff and Barr 1967). As with the preceeding phase, radiocarbon dates are important for identification of Spiro phase off-mound sites. Most of these off-mound sites lack the elaborate materials generally considered hallmarks of this phase, and very few have been dated in eastern Oklahoma.

Evidence from the Fort Coffee phase (post A.D. 1400) indicates further contraction of the Caddoan area. This phase is characterized by: 1) the termination of mound construction although mounds constructed during earlier phases were occasionally used, 2) a general lack of exotic items such as conch shell and copper, 3) the dominance of shell tempered wares *(Avery Engraved, Braden Punctate, Nash Neck Banded,* and *Woodward Plain),* 4) the presence of localized off-mound cemetery areas, and 5) increased relationships with the prairie-plains area (Wyckoff 1974: 157-164; Burton, Bastian and Prewitt 1969; Bell 1961: 53-60; Orr 1946; Brown, Bell and Wyckoff 1978).

Items suggestive of Plains influence include: bison scapula hoes, bison tibia digging sticks, *Harahey* knives, T-shaped drills, bipointed drills, and rib-edge awls. Small triangular *(Fresno* and *Maud)* and side-notched *(Reed* and *Washita)* point forms are more frequent. Burials are usually flexed and ceramic grave goods are commonly found in association. Houses are generally rectangular with two interior posts, extended entrances, and central hearths during this phase. A limited number of circular houses have been reported (Orr 1946). Refuse pits are common at these sites. Evidence suggests either increased utilization of bison or a change in butchering/procurement practices which result in greater bison bone refuse at these sites.

RED RIVER VALLEY

Evidence of Hochatown focus (*ca.* A.D. 1000 to A.D. 1200) occupations is derived from several multicomponent sites located in the valleys of the southern Ouachitas (Wyckoff 1970a: 106; Rohrbaugh 1973; Gettys 1975). These sites are in the Pine Creek, Broken Bow, Hugo, and Lukfata reservoirs. Except for the Pine Creek Mound Group, these sites have been interpreted as representing small hamlets or base camps. Features include hearths, refuse pits, and burials scattered throughout the middens. The burials are generally extended and accompanied by ceramic grave goods. A rectangular structure with two interior support posts, a central hearth, and an extended entrance has been identified at the multicomponent Beaver site, 34Mc-1 (Wyckoff 1968a: 16). Radiocarbon dates of A.D. 1390 ±90 (Tx-479) and A.D. 1350 ±80 (Tx-626) suggest this house may be too late for inclusion within the Hochatown focus.

The associated artifact assemblages include a variety of ceramic types dominated by grog tempered wares *(Williams Plain* and *Sanders Plain).* Other pottery types include *Smithport Plain, Davis Incised, Maxey Noded Red Ware, Hickory Engraved, Sanders Engraved, Canton Incised,* and *East Incised* (Wyckoff 1970a: 110). Small point forms such as *Alba, Agee, Scallorn, Hayes, Reed,* and *Bonham* dominate. However, large contracting stemmed and expanding stemmed

varieties *(Ellis* and *Williams)* are reportedly associated with these components. No direct evidence suggestive of horticulture has been recovered.

The Sanders focus (*ca.* A.D. 1200 to A.D. 1400) is characterized by: 1) mound/habitation sites, mound sites, and off-mound hamlets, 2) the concentration of exotic and elaborately decorated items at mound sites, and 3) participation in an extensive trade network that included the Arkansas Valley area (Krieger 1946: 171-203; Rohrbaugh 1973). Features include refuse pits, burials associated with ceramic grave goods, and rock lined hearths. A number of multiple burials are reported from the Sanders site (41LR-2). These burials are generally extended and oriented east-west.

The artifact inventory at mound sites is generally elaborate and includes conch shell beads and dippers, engraved shell gorgets, *Foster*-type earspools, long stem clay pipes, and a variety of pottery types. Dominant ceramic types include *Sanders Plain, Sanders Engraved, Williams Plain, Canton Incised,* and *Maxy Noded Red Ware*. Small corner-notched point forms *(Bonham, Alba,* and *Scallorn)* are frequent. Additional artifacts associated with Sanders phase components are celts and ground stone implements. Houses are generally rectangular with central hearths and two or four interior support posts.

The McCurtain focus (post A.D. 1400) is primarily known from investigations conducted in the mountain valleys of McCurtain county. This phase is characterized by: 1) continued reliance on horticulture, hunting, and gathering economic strategies, 2) continued mound construction, 3) status differentiation based on burial associations, 4) a variety of site types which include mound sites and off-mound hamlets and villages, 5) shaft graves with multiple extended burials including ceramic grave goods, and 6) the concentration of exotic and elaborate items at some of the mound sites. The Clement (34Mc-8) and Sam Kaufman mounds (X41RR-1) have yielded exotic and elaborately decorated artifacts. These items include a variety of shell tempered ceramics *(Avery Engraved* and *Nash Neck Banded), Foster*-type earspools, engraved conch shell dippers, conch shell beads, and clay elbow pipes (Wyckoff 1970a: 111; Bell and Baerreis 1951; Skinner, Harris, and Anderson 1969).

Small corner-notched *(Alba, Scallorn,* and *Bonham),* side-notched *(Washita),* and triangular *(Fresno* and *Maud)* points are prevalent. House patterns include rectangular structures with extended entrances at the Clement site (34Mc-8) and circular structures at the A. W. Davis (34Mc-6), E. Johnson (34Mc-54), and Beaver (34Mc-1) sites. Refuse pits are present at off-mound and mound sites (Wyckoff 1970: 111).

In summary, the evidence suggests both temporal and regional variations within the Caddoan area during the Mississippian period. Distinctions are most obvious for burial practices, architecture, artifact assemblages, and economic activities. The economic strategies inferred for both areas generally involve hunting and gathering resources from riverine and woodland environments combined with food production. The presence of large quantities of bison bone may reflect an increased interest in the Plains as a resource area during Fort Coffee phase occupations in the Arkansas River

Valley area (Wyckoff 1974: 163-164). However, the quantity of corn from the Clement site (34Mc-8) in the Red River area suggest continued emphasis on horticulture in addition to hunting and gathering (Bell and Baerreis 1951).

Major problems exist when attempting to relate off-mound sites to any of the temporal or regional designations previously discussed. Phase distinctions are generally based on differences observed at the mound centers since many of the exotic and elaborately decorated items characteristic of these phases are restricted to the mound sites. Therefore, radiocarbon dates are critical at off-mound sites for finer placement within the Caddoan tradition. This is especially true for occupations in areas peripheral to the major drainage systems such as the Jackfork Creek Basin and other interior valley areas.

PREVIOUS RESEARCH IN THE JACKFORK CREEK BASIN

Archaeological investigation of the Jackfork Creek Basin began in 1972 with a survey in which 31 prehistoric sites were recorded (Neal 1972). Preliminary testing of these sites plus two new sites was accomplished between May 17 to July 1, 1976 (Bobalik 1977). Further reconnaissance was carried out in late December 1976 and early January 1977. At this time, six new sites were recorded and five of these were tested (Drass 1977: 595-657). More extensive work was conducted at 34Pu-99 prior to its destruction by dam construction activities (Bobalik 1978).

Based on the analysis of the 38 tested sites, occupations during five cultural horizons were tentatively posited for the project area (Bobalik 1977: 555-574; 1978). These included Archaic, Woodland, early Caddoan, late Caddoan, and historic. In addition, the evidence suggested that the Jackfork Basin was more intensively utilized during the Late Archaic, Woodland, and early Caddoan periods. During other periods, there appears to be limited use or virtual abandonment of the valley (Bobalik 1977: 555). Difficulties in determining the intensity and manner in which the valley was occupied stem from the limited nature of the testing program, the lack of an established chronology within the research area, and the fact that many of the sites suggested occupations during more than one cultural period.

Potential Paleo-Indian and Early Archaic occupations are indicated primarily from surface materials (Bobalik 1977: 560). Based on the recovered artifact assemblages, 13 sites (Table 5) suggest either Middle Archaic or Late Archaic occupations (Bobalik 1977: 564). Given the limited data, it has not been possible to definitely segregate Woodland components (Table 5). Some of the sites postulated as indicating Woodland components could also represent Late Archaic or Early Caddoan occupations. Woodland components have been tentatively posited for several sites. Early Caddoan occupations are indicated at four sites (Bobalik 1977: 571). If the ten sites classified as exhibiting Woodland and/or early Caddoan components are included, then utilization of this valley is intensified during the early portion of the Caddoan period (Table 5). The late Caddoan (post A.D. 1400)

period is questionably represented within the Jackfork Creek Basin. Originally, two sites (including 34Pu-99) were postulated as exhibiting materials indicative of this period (Table 5). However, the data recovered during subsequent investigations indicated that 34Pu-99 functioned as a repeatedly occupied base camp during the later portion of the early Caddoan period (Bobalik 1978: 167).

As mentioned previously, several types of sites have been reported for the Caddoan area. These include: ceremonial centers such as Harlan, 34Ck-6 (Bell 1972), Spiro, 34Lf-40 (Brown 1966), and Sanders, 41LR-2 (Krieger 1946); villages such as Littlefield I, 34Lf-62 (Orr 1939, 1946) and Horton, 34Sq-11 (Wyckoff 1970b); hamlets such as Cat Smith, 34Ms-52 (Wyckoff and Barr 1967) and Beaver, 34Mc-1 (Wyckoff 1968a); base camps such as Scott, 34Lf-11 and Wann, 34Lf-27 (Galm and Flynn 1978: 162); and special purpose extraction camps.

Preliminary investigations in the Jackfork Creek Basin (Neal 1972; Bobalik 1977, 1978) suggested that ceremonial centers and villages were lacking within this area. In addition, these investigations did not indicate any evidence of small, permanent year-round habitation sites (hamlets). Two categories of sites were postulated for the Jackfork Valley. These included long- or short-term base camps and special purpose (extraction) camps (Bobalik 1977: 42; 1978: 3-7). In addition, several activities were hypothesized for the Jackfork Creek Basin sites. These include lithic reduction, hunting, vegetal resource processing, storage, and the processing of undetermined resources (Bobalik 1977: 563).

Table 5. Tentative chronological placement of Jackfork Creek Basin sites based on the preliminary investigations in 1976.[1]

PALEO-INDIAN/EARLY ARCHAIC	ARCHAIC	LATE ARCHAIC
34Pu-103	34Pu-71/72	34Pu-73
34Lt-23	34Pu-74	34Pu-102
34Lt-25	34Pu-79	34Pu-105
34Lt-33	34Pu-99	34Lt-30
34Ps-57	34Lt-26	34Ps-57
	34Lt-27	
	34Lt-32	
	34Lt-56	

LATE ARCHAIC/WOODLAND	WOODLAND/EARLY CADDOAN	EARLY CADDOAN
34Pu-73	34Pu-71/72	34Pu-105
34Pu-75	34Pu-74	34Pu-99
34Pu-77	34Pu-78	34Lt-22
34Pu-83	34Pu-100	34Lt-27
34Lt-21	34Pu-102	
34Lt-23	34Pu-105	
34Lt-25	34Lt-26	
34Lt-34	34Lt-30	
	34Lt-31	
	34Lt-32	
	34Lt-57	

LATE CADDOAN	HISTORIC
34Pu-105	34Pu-99

[1]Data derived from Bobalik (1977)

CHAPTER 5

HISTORICAL OVERVIEW OF THE CLAYTON LAKE PROJECT AREA

Christopher Lintz

INTRODUCTION

The Historic period coincides with the earliest recorded Euro-American interaction with local and later displaced aboriginal groups up to the present. This survey focuses on the immediate region around Clayton Reservoir, the Jackfork and Kiamichi valleys, but a broader region must be considered in order to place the local events in their proper perspective. The historical perspective of the Jackfork Valley not only provides a rough outline of major events but also highlights demographic, economic, and social conditions of people living in the region. Whenever possible, historical places and events will be tied to the Clayton Lake Project Area. For purposes of discussion, four temporal stages are recognized: Exploration period (1719-1820), Early Choctaw Settlement period (1820-1861), Late Choctaw Settlement period (1861-1907), and Statehood period (1907-present).

EXPLORATION PERIOD (1719-1820)

This period coincides with the earliest documentation by European explorers until the settlement of the region by Choctaw Indians. The earliest entry of Europeans in the upper Arkansas and Red river areas is uncertain. Examination of early maps reveals that some Indian villages and basic river trends were known by the 1690s (Wedel 1971; Sudbury 1975). Apparently, French coureurs-de-bois, voyageurs, and traders legally and illegally entered the region without leaving journals or documents.

The earliest description of the Jackfork and Kiamichi valleys was by La Harpe in 1719. J. B. Benard Sieur de la Harpe was given a land grant on the Red River and ordered to establish a post among the Kadohadocho, explore the Red River, learn of groups in the region, and develop trade alliances with unknown tribes to the north and west (Johns 1975: 213). After establishing his post near the Nassonites (a band of the Kadohadocho Confederacy residing in Bowie County, Texas), La Harpe dispatched an expedition led by Sieur Du Rivage to briefly locate nomadic tribes west of the Nassonite on the border of the Red River (Lewis 1924: 332; Smith 1958: 372). Du Rivage traveled 70 leagues[1] along the Red River and

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[1]A French posting league and Flanders League is equivalent to 2.634 statute miles (McRill 1963: 134).

returned to the post on June 29, 1719 accompanied by two Kichai guides he secured for La Harpe's expedition.

After purchasing additional horses, La Harpe's expedition left the post on August 11, 1919, to develop trade alliances with unknown groups northwest of the Red River. Their approximate route follows the Little River north into the Kiamichi Mountains where they encountered two Caddo bison hunting groups (Nassonites and Nadsoos) who reported to La Harpe that they were upset because the Osage (Anahons) were in the vicinity. La Harpe then crossed into the Hurd Creek Valley and descended into the Kiamichi Valley approximately two miles southeast of present day Clayton (Lewis 1924: 338). On August 23 they entered Jackfork Valley:

> ...we advanced in the prairie towards the northwest, a quarter north, two leagues after which we passed a small river which flows towards the south [Anderson Creek], which meanders between several mountains and goes running into the river above the old Nadsoos village [Kiamichi]. We camped, then, in order to let our horses rest...
>
> The 24th we continued to advance into the plain to a very thick forest near a stream which was necessary to cross; in the afternoon, we entered into [Jackfork] mountains very difficult to pass because of the overthrown rocks that are found there... (Smith 1958: 382-383).

After considerable difficulty in the Jackfork Mountains, La Harpe entered the Buffalo-Gaines Creek valleys where he shared a calumet with 20 Anahons (Osage) warriors. On August 27th he encountered a recently abandoned campsite which, he found out from a Nabedache scout, was occupied by 60 Cancy (Lipan Apache) warriors with horses. The remainder of La Harpe's journey is not relevant to local history, except that he mentions "prodigious numbers of wild buffalo", deer, bears, wolves, partridges, snipes, plovers within three days of Jackfork Creek (Smith 1958).

Very little is known about aboriginal activities conducted in the Jackfork and Kiamichi drainages during the remainder of the 18th century. It appears that no other sanctioned French or Spanish explorations entered the region even though illegal intrusions by traders and trappers continued.

The second expedition to the Kiamichi River area was by Major S. H. Long, 14 years after the United States purchased the Louisiana Territory, in order to recommend the establishment of forts and cantonments in the region (Wood 1966). In October 1817, Majors Long and Bradford ascended the Arkansas River and established a cantonment near the Osage boundary at Belle Point (Ft. Smith) in order to stop hostilities between the Osage and Cherokee (Wood 1966: 52; Foreman 1936: 27-29). Major Bradford remained at Cantonment Smith to insure peace.

In December 1817, Long was ordered to the Red River to check on illegal trade with the Indians and to prepare an evaluative statement concerning control of the region. Details of this trip are not published. However,

Long ascended the Poteau River, Fourche Maline, and Long creeks and crossed the Winding Stair Range into the Rock Creek tributary of the Kiamichi. Although his map errs in the geographical relationship between the Potato Hills and Kiamichi River, it clearly indicates that he was on the south bank of the Kiamichi River when he passed the mouth of Jackfork Creek (Edwin 1906). Long followed the Kiamichi south of the Red River and returned overland by way of Hot Springs, Arkansas. Although little is known of the people he met on the trip, he apparently encountered enough illegal traders and settlers in the region to recommend the establishment of two posts (Cantonments Gibson and Towson) between the fringe of Euro-American settlement and Indian tribes (Wood 1966: 54).

In 1819, Thomas Nuttall, a botanist, arrived at Cantonment Smith on his way to the Ricky Mountains. While awaiting supplies, he was asked to accompany Major Bradford to evict white settlers found living "west of a line drawn from the source of the Kiamichi to the Poteau" (Foreman 1936: 146) in preparation for Choctaw removal.

By mid-May, Bradford, Nuttall, six soldiers, and two Cherokee guides followed almost the same route as Long's expedition. From Cantonment Smith the expedition ascended the Pottoe (Poteau) and Malin (Fourche Maline) creeks and crossed the Winding Stair Range and entered a "prairie cove" in the Kiamichi Valley east of the Potato Hills (Nuttall 1821: 142). On May 18-19, 1819, the expedition followed the level prairie cove where they "skirt the south side of the bare serrated hills scattered with pine and post oak (Potato Hills) and proceed past the three branches of Kiamichi" (Nuttall 1821: 150). These branches are identified as "Jack's Creek to the south, Kiamichi to the east, and a third rivulet to the north" (Nuttall 1821: 162).

This journal entry has troubled some historians since Jackfork Creek is not south of the Kiamichi, as was identified on Tammer's map drawn from Nuttall's description and published in Nuttall's book. Many have assumed that Nuttall was lost or confused. However, if he meant "Jack's Creek" *flows* to the south, Kiamichi *flows* to the east, and a third rivulet *flows* to the north then the correct geographical relationship is obtained with the third rivulet identified as Hurd's Creek. If this is correct, Nuttall was unaware of Buffalo and Anderson tributaries of Jackford Creek, and the mouth of Jackfork Creek may have been one of the "little rivulets or torrents" Nuttall had to cross while following the Kiamichi. He apparently does not cross to the south bank of the Kiamichi until the evening of May 19th (Nuttall 1821: 150). The expedition probably passed within two miles of the Clayton Lake Project Area, but never entered the Jackfork Valley.

Near the prairie cove, Nuttall mentions troublesome ticks, herds of bison, bears, and panthers *(Puma)* and describes the valley as being "hemmed in with lofty pine hills" (Nuttall 1821: 140, 162). Although no Indians were encountered, Nuttall describes two Osage markers consisting of a rock cairn along the trail on top of the Mazern (Winding Stair) Mountains, marking passage of a way party, and a "solitary tree fantastically trimmed like a broom" on a conspicuous summit near the mouth of Jackfork Creek (Nuttall 1821: 149-150). The Osage frequently stripped trees in prominent places to denote territorial boundaries and to warn trespassers of their claim

(Mathews 1961: 495). Even though, in 1817, the major Osage villages were located along the Verdigris and Grand-Neosho rivers in northeastern Oklahoma and Marais de Cygnes in southeastern Kansas, the Osage may have laid claim to the Jackfork Valley as their exclusive hunting grounds.

The trip down the Kiamichi River is uneventful. Major Bradford served notice on almost 200 families living on the lower Kiamichi and returned to Ft. Smith on May 26th (Foreman 1936: 146). However, overwhelmed by new plant species, Nuttall missed the rendezvous and was forced to spend an additional 19 days on the Red River. He returned with a party of hunters and got lost in the Kiamichi Mountains (Graustein 1967). By following a bison path along the Kiamichi through "successions of horrid labyrinthine thickets and cane breaks", they emerge at the "extensive cove covered with grass" at the entrance of "Jack's Fork Creek" on June 17th, 1819 (Nuttall 1821: 162). The journal does not mention encountering any people in the Jackfork Creek area. Once in the prairie cove the trip to Ft. Smith was direct.

Early journals by explorers do not indicate that the Jackfork Creek basin was settled by any Indian groups during the Early Historic Period. The few documents constantly refer to a lack of trails in the immediate region, and it seems surprising that Major Long and Thomas Nuttall took nearly identical routes to the Red River (Fig. 5a).

Jackfork Valley was an open hunting territory used by various Caddoan groups, Osage, and perhaps Lipan Apache, and later joined by Cherokee, Delaware, and Choctaw groups prior to removal (Swanton 1942; Debo 1933; Gibson 1965: 83). Constant Osage warfare may have kept the area from being permanently occupied.

The earliest settlement of the region is uncertain. La Harpe was the only one to actually traverse Jackfork Creek. The century-long hiatus between the La Harpe and Long-Nuttall expeditions does not mean that Europeans and Americans were not crossing the area. The presence of nearly 200 families on the lower Kiamichi attest to the number of people entering the western Arkansas Territory. Furthermore, "Jack's Fork Creek" is known well enough to be specifically mentioned by Nuttall in 1819. The creek may have been named after early hunters or settlers residing in the region (Gibson 1965: 85). However, the Jackfork Creek basin was apparently a backwood hinterland that was sparsley populated during the Late Exploration Period.

EARLY CHOCTAW SETTLEMENT PERIOD (1820-1861)

The Early Choctaw Settlement period coincides with the Choctaw removal and settlement and lasts until the outbreak of the Civil War in Oklahoma. This period is marked by Choctaw self-determination as a nation separate from the United States.

Prior to removal, the Choctaw lived in three separate but contiguous groups in Mississippi: 1) Okla Hannali in the south, 2) Okla Falaya in the west, and 3) Okla Tannip in the east. The Choctaw worked closely with Americans during the War of 1812 and realized benefits of adopting "civilized" institutions. Interaction with the American Republic strengthened the Choctaw political system and established a pattern which continued long after Choctaw removal to Oklahoma and Arkansas. In a series of treaties between 1801 and 1816, the United States developed a policy of providing tribal annuities and compensating Choctaw who had suffered individual loss from Mississippi lands ceded to the government (Debo 1934: 34). To further educate their people, the Choctaw used tribal money to establish school systems. The quickest mechanism for developing an educational system was to invite missionaries to settle in their country and, by 1818, many Choctaw had converted to Christianity. Thus Choctaw political, educational, and religious systems were developed prior to their removal to Oklahoma.

With the acquisition of the Louisiana Territory, and the expansion of settlements west of the original states, the American Republic was ready to initiate a series of removal treaties with Indians residing east of the Mississippi. The Treaty of Doak's Stand in 1820 was an attempt to entice the Choctaw to voluntarily exchange lands for wild territory between the Red and Arkansas-Canadian rivers east of the 100th meridian and west of a line from Point Remove, Arkansas to the Great Bend of the Red River. Each warrior was provided a rifle, bullet mold, camp kettle, blanket, food and ammunition for one year, monetary compensation for improvements on lands in Mississippi, and the use of a blacksmith and Indian agent (Debo 1933; Harlow and Gibson 1967: 47).

Prior to the Treaty of Doak's Stand, several Choctaw chiefs visited this area. They complained about white settlers in the region and requested that the government clear the lands (American State Papers 1834: 549). Despite the Bradford-Nuttall expedition to evict settlers, early Choctaw immigrants encountered Euro-American families living along the rich bottomlands of the Arkansas and Red rivers. Protests by Choctaw and non-Indian settlers resulted in a western Arkansas boundary dispute.

Two unsanctioned surveys financed by Arkansas Territory residents in 1823 established boundaries south of the Three Forks locale on the Arkansas River and south of the southwest corner of Missouri (Foreman 1936: 150). The former survey line passed through the headwaters of Jackfork Creek and may have crossed the Clayton Reservoir area. Congressional enactment in 1824 officially established the western boundary of Arkansas on a line 41 miles west of the southwest corner of Missouri (Morris, Goins and McReynolds 1976: map 21). This line passes near the mouth of Jackfork Creek. Ft. Towson was established to control white settlers on the Red River during the same year, but the 1824 act violated conditions established in the Treaty of Doak's Stand. Consequently the 1825 Treaty of Washington readjusted the western border of the Arkansas Territory to a line running south of a point 100 paces east of Ft. Smith on the Arkansas River to the Red River. Protests from the nearly 2000 non-Indians living in the Choctaw Territory went unheeded since the Arkansas Territory gained land over that

granted in the Doak's Stand Treaty. The United States agreed to pay "forever" an annual sum of $6000 to the Choctaw Nation for the newly acquired land and to remove white settlers.

Despite enticements offered by the Treaty of Doak's Stand and settlement of the Arkansas Territory boundary disputes, relocation of the Mississippi Choctaw was not making much progress. By 1829 only 150 families moved (Debo 1934). As a result, the Treaty of Dancing Rabbit Creek in 1830 was negotiated in which all Choctaw lands in Mississippi were ceded to the government. In return, the Choctaw received no tribal monetary compensation, but were guaranteed jurisdiction and government control over all property, resources and people in their new lands, and assurances that they would not become a part of any territory or state. Those people wanting to relocate were paid for cattle and property left behind, provided with transportation, and given food for one year. Those wishing to remain in Mississippi were allowed to select individual land allotments and become United States citizens (Debo 1934: 55). The major Choctaw removal did not occur until 1831-1833.

Soon after arrival, the Choctaw divided their new lands into three districts and named them after their chiefs (two of them, Pushmataha and Apukshunnubbee, died during an 1824 trip to Washington, D.C. to dispute the Arkansas boundaries). The Okla Falaya became the Apukshunnubbee District along the Red River east of the Kiamichi River, Okla Tannip became the Moshulatubbee District along the Arkansas-Canadian River, and the Okla Hannali became the Pushmataha District (containing the entire Clayton Lake Project Area) along the Red River west of the Kiamichi (Debo 1934: 58; Gunning n.d.a: 69). Choctaw settlement within these districts was not uniform. In general, the wealthy and slave owners lived along the fertile lands of the Red and Arkansas rivers while the poorer people were concentrated in the hills.

An important military road connecting Ft. Towson to Ft. Smith was constructed in 1832 and used until at least 1840. This served as the boundary line between the Apukshunnubbee and Pushmataha Districts, and is approximately 152 m (500 feet) east and parallel to the central axis of the proposed Clayton Lake Dam (Wright 1931). The construction of this road opened the Jackfork Creek Valley to Choctaw settlers and provided easy access to goods and supplies at Ft. Towson and Ft. Smith.

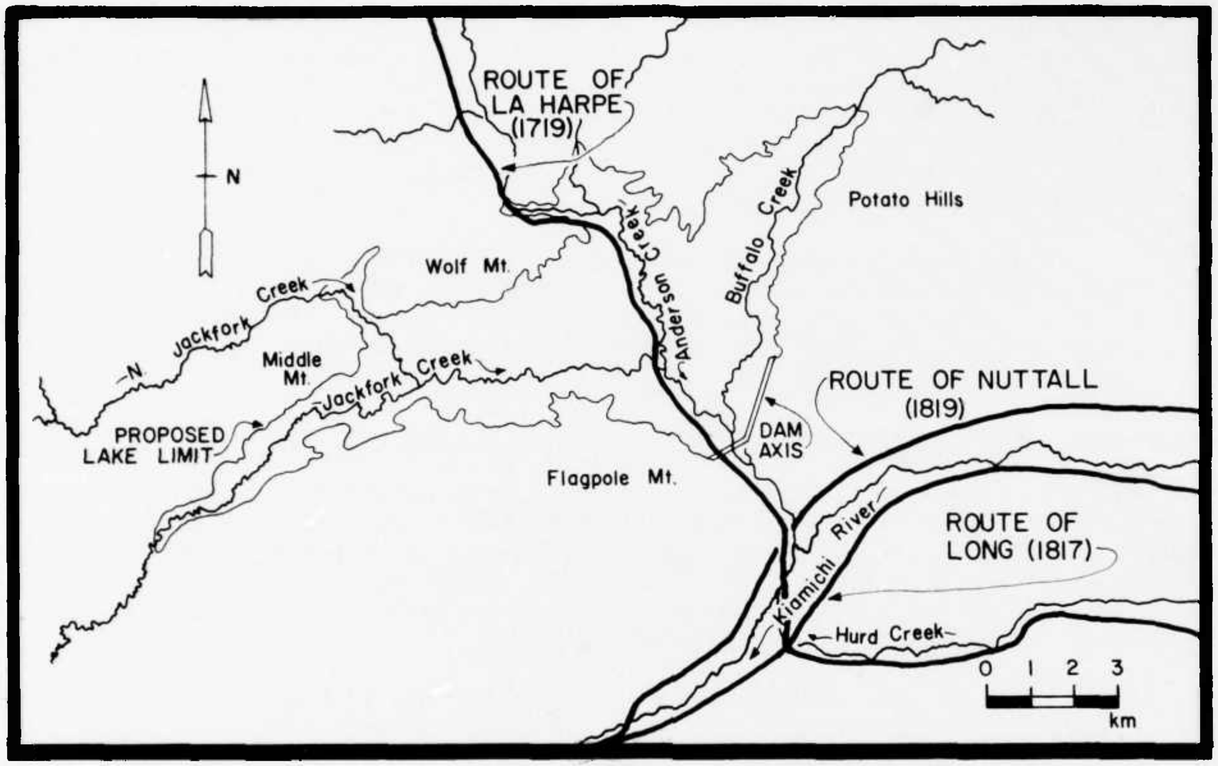
Although the soils are shallow and highly acidic, most early settlers found the Jackfork Valley a rich wilderness, with grass as high as a man's head riding on horseback and thick cane breaks along the creeks. Much of the valley and surrounding hills were covered with a dense pine forest (Adams 1942; Anonymous n.d.b: 169; n.d.a: 256). The average Choctaw homestead was approximately five acres where subsistence farming was practiced. They raised chickens, horses, cattle, and hogs on the open range and grew potatoes and a variety of vegetables. They also supplemented their diet with wild deer, bison, bear, turkeys, rabbits, fish, and store-bought supplies obtained every few months from Ft. Smith (Anonymous n.d.c: 352; n.d.d: 42; n.d.e: 471).

Reuben Anderson, a Baptist missionary accompanying the Choctaw from Mississippi, founded the Sardis Mission west of Anderson Creek. The Buffalo

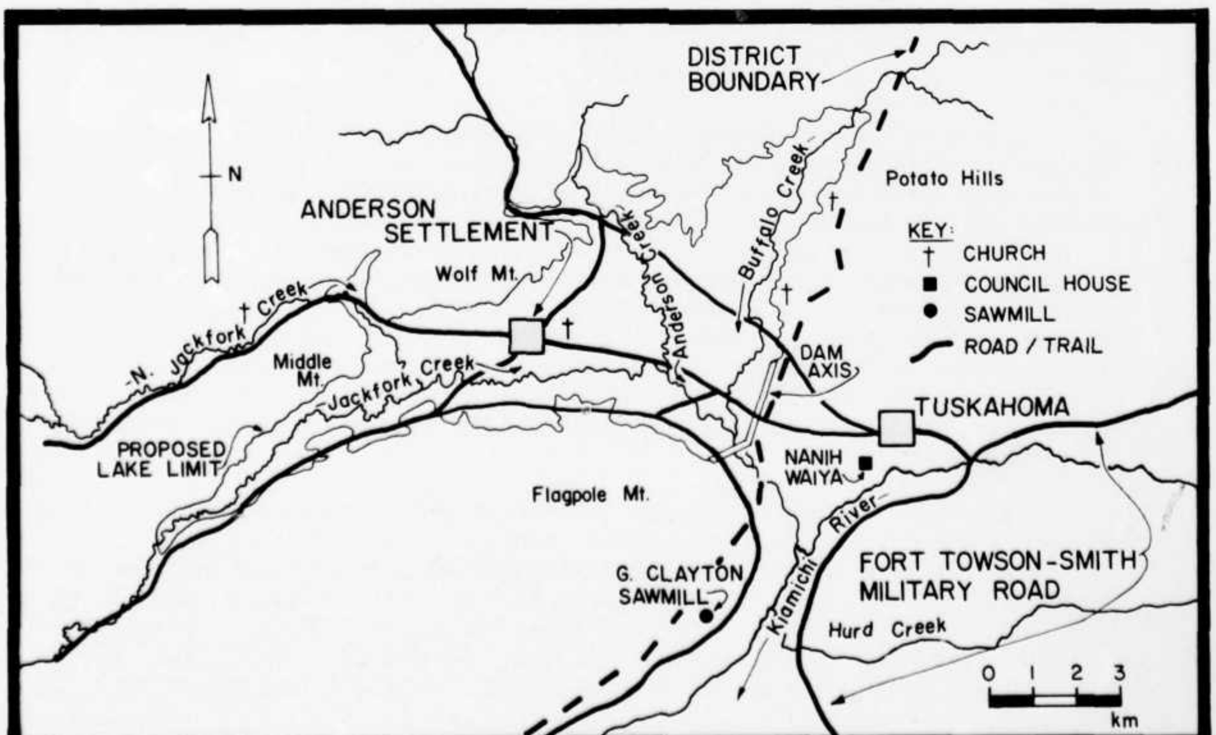
Fig. 5. Major routes, communities, and industries.

a: Exploration Period (1719-1820).

b: Early Choctaw Settlement Period (1820-1861).


ROUTE OF LA HARPE (1719)
N
Potato Hills
Anderson Creek
Buffalo Creek
Wolf Mt.
Creek
N. Jackfork
Middle Mt.
Jackfork Creek
ROUTE OF NUTTALL (1819)
PROPOSED LAKE LIMIT
DAM AXIS
Flagpole Mt.
Kiamichi River
ROUTE OF LONG (1817)
Hurd Creek
0 1 2 3
km

a.


DISTRICT BOUNDARY
N
Potato Hills
ANDERSON SETTLEMENT
Anderson Creek
Buffalo Creek
KEY:
† CHURCH
COUNCIL HOUSE
SAWMILL
ROAD / TRAIL
Wolf Mt.
N. Jackfork Creek
Middle Mt.
Jackfork Creek
DAM AXIS
TUSKAHOMA
PROPOSED LAKE LIMIT
NANIH WAIYA
Flagpole Mt.
Kiamichi River
FORT TOWSON-SMITH MILITARY ROAD
G. CLAYTON SAWMILL
Hurd Creek
0 1 2 3
km

b.

and Cupco Churches were built east of Buffalo Creek at about the same time. In addition to church functions they also served as neighborhood schools (Anonymous n.d.a: 293, 356; n.d.b: 168-169, 172). Anderson Settlement grew around the Sardis Mission and the community of Yanush developed a mile north of Cupco Church, and became early hubs of social life in the reservoir area. In addition to religious and school meeting places, the churches served as sites for political campaigns, social gatherings, annuity payments, funeral "cries", and stick ball games (Debo 1933).

A log council house was constructed in 1838 close to the geographical center of the Choctaw Nation. It was named Nanih Waiya, after a sacred mound in Mississippi and attracted new growth and prosperity. Numerous roads and the town of Tushahoma were established to accommodate visitors to the first Choctaw capital.

The new prosperity resulted in land clearing, building activities, and the beginning of a lumbering industry in the area. Gerome Clayton founded a sawmill by 1840 on the Kiamichi River. Numerous portable sawmills were imported to rough-cut the dense stands of pine in the hills for processing at permanent sawmills along major roads. Hindered by poor transportation, lumbering was oriented toward local needs. However, with construction of the railroad in 1887, lumbering became a major economic activity throughout the Jackfork Valley which lasted almost 50 years.

Major changes in Choctaw government occurred during the politically stormy peroid between 1850 and 1863. In 1850, the three districts were organized in 19 counties. At the same time the capital was moved from Tuskahoma to Doaksville near Ft. Towson. The economic growth rate in the Jackfork Valley leveled off as a result of this change, even though Tuskahoma remained the county seat for Wade's County. Jackfork County, encompassing the Clayton Lake Project Area, established its county seat at Many Springs (Morris, Goins, and McReynolds 1976: 38).

Other governmental changes occurred in quick succession. The first Choctaw Constitution was drafted at Skullyville in 1857 abolishing the office of district chief and establishing a national governor. In addition, the Choctaw capital was moved from Doaksville to Boggy Depot. This constitution was bitterly opposed by conservative factions at Doaksville. They established a rival government and wrote a new constitution. The compromise Constitution of 1860 incorporated the older district chiefs and court systems and set up a new national government based on a bicameral general council, a principal chief, and a supreme court. The capital was subsequently moved back to Doaksville. Three years later the capital moved to "Chahta Tamaha" at the present town of Armstrong. Most of these governmental changes had little effect on growth in the Jackfork Valley.

In summary, the Early Choctaw Settlement period saw the initial settlement of Jackfork Creek Valley by relatively poor, self-sufficient Choctaw families living on small farmsteads. A major population boom occurred between 1838 and 1850 when the Choctaw capital of Nanih Waiya was founded at Tuskahoma. Economic improvements included the establishment of roads and lumbering industry in the region (Fig. 5b). By the eve of the Civil Way, the economic prosperity of the region declined when the Choctaw capital shifted away from Tuskahoma.

LATE CHOCTAW SETTLEMENT PERIOD (1861-1907)

The Late Choctaw Settlement period coincides with the Reconstruction period following the Civil War until Oklahoma statehood. This period is marked by indirect hardships imposed by the war, a decline in Choctaw self-determination, and an increase in American control of the region.

Although the Choctaw Nation received annuities from the United States up to the beginning of the Civil War, a series of extenuating circumstances virtually forced the Choctaw to become sympathetic to the Confederate cause (Debo 1934: 80). In their effort to adopt European institutions, the Choctaw were exposed to and embraced slavery in Mississippi, and many rich Choctaw brought their slaves westward in the 1830s. Furthermore, preoccupied with Confederate forces, the Union was forced to neglect diplomatic relations with adjacent Indian groups. Finally, the Indian agent administering Federal policies to the Choctaw was a southerner. Agent Douglas Cooper (later a general in the Conferderate army) and other southerners launched an intense propaganda campaign maintaining that the Choctaw were neglected because the Union was on the verge of collapse.

On June 10, 1860 the General Council declared the Choctaw Nation independent of the Union and appointed commissioners to develop alliances with the Confederate States. A treaty was signed on July 12, guaranteeing Choctaw independence and protection once the Union fell. In addition, the Confederate Government agreed to assume all obligations owed by the United States to the Choctaw Nation.

The Choctaw and Chickasaw actively raised regiments to fight Union forces by 1861. Although no Civil War battles were fought in the Ouachita Mountains, major fighting occurred in the Cherokee and Creek Nations north of the Arkansas River (Wright and Fischer 1967). By 1863 thousands of Cherokee civilians had fled from their homes before Union army invaders and established refugee camps along the Boggy, Blue, and Kiamichi Rivers in the Choctaw Nation (Debo 1932: 255-266). Although the precise locations of these camps are uncertain, the Kiamichi camp may have been located near the Jackfork Valley. By 1865 over 6000 Cherokee and a large number of Creek were still residing on Choctaw lands (Debo 1933: 44). The impact of the refugees severely strained food reserves and production. Many Choctaw, including those in the Jackfork Valley, nearly starved to death (Anonymous n.d.f: 331; n.d.a: 148).

The Civil War officially ended for the Choctaw on June 19, 1865 when Choctaw military forces surrendered at Doaksville. Under terms of the armistice, the Choctaw were to lay down their weapons and the United States promised protection from Indians affiliated with the Union until a peace treaty could be ratified (Debo 1934: 85).

The Choctaw were considered to be rebel Indians and were at the mercy of the Federal government. They expected to lose all rights to self-jurisdiction, tribal territory, and annuity payments established under earlier treaty provisions. However the treaty ratified on December 21,

1866 contained major sections in favor of the Choctaw. The Choctaw retained 1) Indian jurisdiction over intermarried, adopted citizens, and white immigrants in their territory; 2) a tribal judiciary to operate along side established court systems of the United States; and 3) most of their original territory granted to them under the 1820 treaty. In addition, the United States agreed to resume tribal annuity payments. Major concessions made by the Choctaw included abolishment of slavery with adoption of freedmen into the Choctaw Nation, cession of lands in western Oklahoma known as the "Leased District", acceptance of 10,000 Kansas Indians into their territory, permission to establish railroads across the Choctaw Nation, and permission to survey and divide lands for eventual establishment of individual allotments (Debo 1933; Gunning n.d.: 25). The adoption of freedmen and railroad survey rights were not granted until the 1880s (Gunning n.d.: 33).

Little is known about economic conditions in the Jackfork Valley immediately following the Civil War. For nearly a decade war refugees, deserters, and white renegades brought rampant violence throughout the Choctaw Nation. However, few Euro-Americans immigrated to take advantage of the disorganized political situation. Most of the natural resources were still controlled by the Choctaw Nation, but ambitious Americans discovered that they could exploit the region by marrying into the tribe. Within the Jackfork Valley, lumbering was the major economic activity, however, poor transportation routes still limited its exploitation capabilities.

In 1884, the Choctaw moved their capitol back to Tuskahoma. A three story brick building was constructed at a site two miles northeast of the original Nanih Waiya council house. The return of the Choctaw capitol was an economic boost to "old" Tuskahoma. Within the next few months two hotels, several general stores, a blacksmith shop, school, photographer's tent, and post office were constructed at the capitol (Adams 1942; Shirk 1974).

However, economic prosperity at "old" Tuskahoma was short-lived. The St. Louis-San Francisco railroad surveyed a route along the Kiamichi in 1887. They attempted to extort Tuskahoma by demanding a sizable "bonus" for building a railroad through town (Wright 1931: 29). When the Choctaw Council refused, the right-of-way passed two miles south of Tuskahoma. Merchants soon realized the transportation advantages offered by the railroad and a new Tuskahoma townsite developed around the tracks. To the southwest, the railroad passed by Gerome Clayton's sawmill where the town of Dexter arose (Adams 1942). Dexter officially changed its name to Clayton by petition in 1904, but the post office continued to be called Dexter until 1907 (Shirk 1974).

The railroad had a profound economic impact on the region. Lumber was not only used in constructing the railroad, but was economically exported for the first time. Many Euro-Americans moved into the area and lived in lumber camps around sawmills. Since lumber camps periodically moved as timber resources became depleted, the houses of employees were "of the most primitive and impermanent construction" (Anonymous n.d.g: 238; Adams 1942). Portable sawmills frequently cleared lands within a 50 mile radius of the

major sawmills at "new" Tuskahoma and Dexter (Adams 1942). Many families were afraid of the Choctaw so the mills established separate company stores, doctors, schools, and churches to accommodate employees. Despite segregated conditions, vegetables and wild game were purchased from the Choctaw to supplement company food rations.

Another industry, made economically feasible by the railroad, was the mining of asphalt. Extensive coal deposits in Gaines Creek Valley and around McAlester had been commercially mined since 1872, however no major deposits are known for the Jackfork Valley (Gunning 1975: 79). The recognition of asphalt deposits in 1892 near coal deposits brought renewed prospecting to adjacent counties. In 1902, the largest known deposit of natural asphalt in the world was discovered south of Anderson settlement (Gunning 1975: 23). Low grade asphalt (grahamite) mining started in 1903. Unrefined grahamite was hauled by horsedrawn wagons to Tuskahoma where it was loaded onto trains. A small settlement, Bunchtown, developed around the mining operation, and in 1905 it and Anderson settlement were integrated into Sardis, named after the original Baptist mission founded by Reuben Anderson (Shirk 1974). At the same time more ambitious mining operations were introduced by the Ft. Smith Asphalt Company. By 1910, the company had two slope mine shafts which reached a depth of 125 ft. At its peak, the mines at Sardis produced 40 tons of asphalt a day. Asphalt production continued at Sardis until 1922 when it was replaced by refined petroleum asphalt (Gunning 1975: 24).

Most of the local Choctaw community did not participate in either the lumbering or mining operations, although both industries paid royalities to their government. Tribal funds were used to build a women's boarding school in the area. The Tuskahoma Female Institute lasted from 1892 until it burned in 1925.

Many Choctaw in the area became politicians, merchants, farmers, and ranchers. By the turn of the century, most of the bottomland had been cleared by underbrush burning. Horses, cattle, and hogs continued to be raised on open range, but less than 10% of the land was under cultivation with corn, grain sorghum, native grasses, cotton, and legumes. A grist mill was constructed at Sardis, and both grist mills and cotton gins were established at Tuskahoma and Clayton (Adams 1942).

The Dawes Commission was established in 1893 to induce Indians to give up tribal ownership of lands in favor of individual homestead allotments. The Commission proposed that: 1) all land except mineral lands and townsites would be allotted in quarter-section tracts among the Choctaw, 2) a territorial government would be established with the nation retaining control over tribal funds and property, 3) the United States would pay expenses incurred by placing allottees on their property, and 4) the Choctaw tribal government could continue to operate until allotments were completed (Debo 1934: 248). The Choctaw summarily rejected these proposals. However, Federal legislation attempted to abolish "outmoded Indian treaties" and at the same time began surveying Choctaw lands to make an equitable assessment for future allotments. Internal dissention developed and many Choctaw felt that they should negotiate with the Federal Government. As a result Choctaw

land surveys were half completed by 1896 and following elections a council was appointed to take an accurate census.

Upset with the slow progress of the Dawes Commission, Congress passed compulsory legislation terminating the tribal government but President Cleveland pocket vetoed the bill. The radical congressional action brought the Choctaw into serious negotiation with the Commission. By 1897, the Atoka Agreement was drafted which established land allotment procedures, and included most of the proposals previously offered by the Commission (Debo 1934: 260). Conditions of the Atoka Agreement were ratified by Congress under the Curtis Act of 1898.

The loss of rights and control were becoming apparent to members of the five civilized tribes. With individual allotment and the opening of other lands to outside settlers, the Indian Nations were being incorporated within the United States. In a final attempt to retain some Indian control, delegates from the five tribes met at Muskogee to form a separate state called Sequoyah. Although a state charter was drafted and ratified by local voters, the bill was tabled in the U.S. House of Representatives. Sequoyah was not achieved. Instead, both Indian and Oklahoma Territories merged to create a single state under the Oklahoma Enabling Act of 1906.

In summation, the Late Choctaw Settlement period was marked by a loss of Choctaw control over their lands and the development of lumbering and asphalt industries in the Jackfork Valley. Two major population increases occurred: the first during the Civil War by Cherokee and Creek refugees and the second following construction of the railroad by transient Euro-American families who worked in the portable sawmills and lumber camps (Fig. 6a). Neither group radically improved the economic conditions of the local Choctaw farmers previously occupying the valley. Cotton was introduced in addition to traditional livestock and crops. Both argricultural needs and lumbering interests cleared the forested hills and valleys during the later half of the 19th century.

STATEHOOD PERIOD (1907-present)

The Statehood period coincides with recent developments following the formation of Oklahoma. This period is marked by a decline in the asphalt and lumbering industries, and a substantial increase of settlers followed by a general migration of rural people toward larger towns.

Despite passage of the Curtis Act in 1898, assignment of individual allotments was not completed until an acceptable census of Choctaw rolls was finished. The criteria for identifying Indians versus non-Indians were established by the United States rather than the Choctaw Nation. However, by 1907 an acceptable roll was completed. Following allotment assignments, large numbers of non-Indians entered the area. By 1930, Indians only constituted six percent of the population of Pushmataha County and only three percent of the population in Pittsburg County (Peach and Poole n.d.a: 12, n.d.b: 13).

Industrial decline was slow but steady in the Jackfork Valley. As previously indicated, the asphalt mines near Sardis closed in 1922 when discovery of synthetic asphalt reduced demands for natural asphalt. Likewise, the lack of conservation measures and cutting restrictions reduced timber resources. By 1940 most of the area around Clayton and Tuskahoma had been cut at least twice, and unmarketable deciduous forests were replacing natural pine stands (Adams 1942). The major sawmills at Tuskahoma were closed by 1942, while the Clayton sawmill could only operate eight to nine months a year. The lumbering industry was largely replaced by charcoal processing plants which used lower grades of wood.

With the decline of lumbering, many transient workers migrated toward the cities (Peach and Poole n.d.a: 97). A major shift toward livestock production occurred in the Jackfork Valley. Portions of the valley and surrounding hills were burned on an average of once every three years to "green up" the pastures (Adams 1942: 56). This practice has intensified the erosional cycle started by lumbering activities. An estimated 85% of the land is in pasture or timber suitable for grazing and no open ranges are left. Angora goats were introduced in the late 1930s, but have not been as successful as cattle or hogs (Adams 1942).

For the most part, agriculture had not noticeably improved since the previous period. Despite a lengthy growing season, the soils are generally too shallow, infertile, and acidic to grow many crops. Although cotton is still grown, the two gins at Tuskahoma have closed. Native hay, sorghum, and corn are still grown to support livestock interests. Barley production, recently introduced, seems to be doing well in the area (Adams 1942; Peach and Poole n.d.a; n.d.b). Many rural people still raise subsistence gardens, but the number of people engaged in agriculture has dropped from 2400 in 1940 to less than 500 in 1960 for Pushmataha County. This correlates with a reduction in the number of farms, but there is an increase in average farm size. In 1925 the average farm in Pushmataha had 87.5 acres and by 1960 the size was 405 acres (Peach and Poole n.d.a: 41).

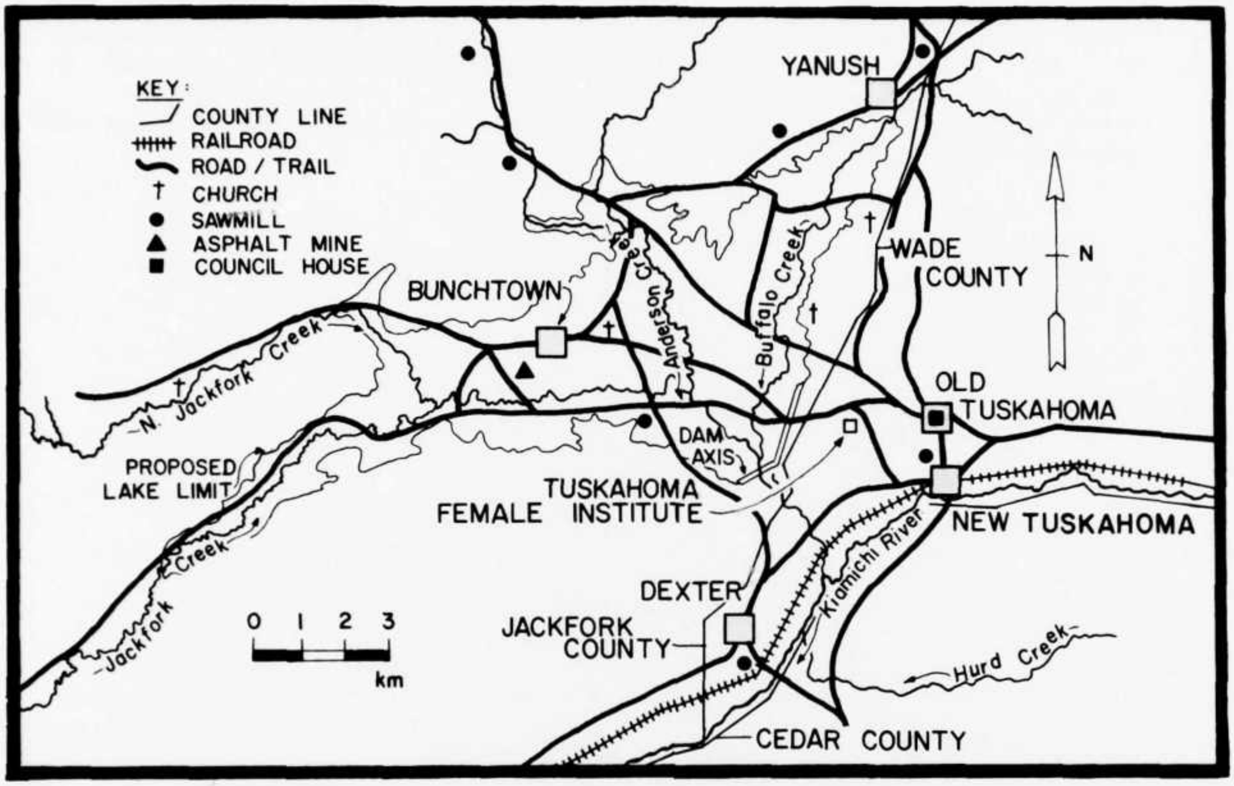
Economic interests in the area have shifted to Clayton. Sardis was largely abandoned with the collapse of asphalt mining. Tuskahoma experienced strong factionalism following World War I which hindered development. Mysterious burnings of several stores in Tuskahoma, as well as the Tuskahoma Female Institute, may be possibly tied to strong Klu Klux Klan activities (Adams 1942). In reaction many businesses moved to Clayton which opposed the Klan. In 1921 construction of State Highway 2, adjacent to the railroad route, was started in the valley (Fig. 6b). Tuskahoma was favored by the Highway Department, but because of "internal jealousy and conflict" in Tuskahoma the road was built through Clayton (Adams 1942).

Since earliest settlement, the Jackfork Creek Valley has been occupied by a series of economically depressed peoples. The poorer Choctaw settling in the hill country during the 1830s, the Civil War refugees during the 1860s, and the transient lumber workers during the 1880s. Most of Pushmataha and Pittsburg Counties are still economically depressed. During the Depression, 80% of the residents of Tuskahoma received some form of government aid (Adams 1942), and by 1962 more than half of the total personal

Fig. 6 . Major transportation routes, communities, and industries.

a: Late Choctaw Settlement Period (1861-1907).

b: Statehood Period (1907-present).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Anderson Creek
Buffalo Creek
OLD TUSKAHOMA
DAM AXIS
PROPOSED LAKE LIMIT
TUSKAHOMA FEMALE INSTITUTE
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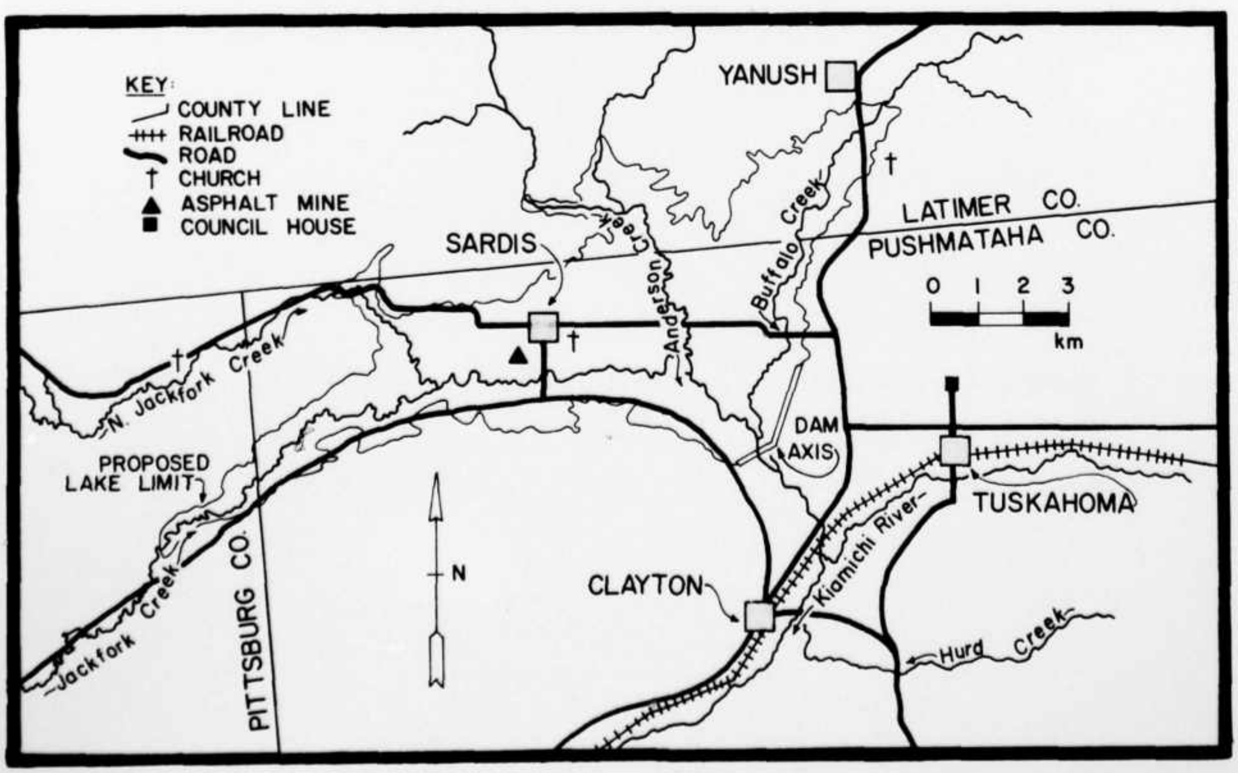
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DAM AXIS
PROPOSED LAKE LIMIT
TUSKAHOMA
Kiamichi River
N
CLAYTON
Jackfork Creek
PITTSBURG CO.
Hurd Creek

b

income in Pushmataha County came from the government (Peach and Poole n.d.a: 30). Many people continue to move away from the rural areas to major cities, like McAlester and Ft. Smith, and the population of Pushmataha County has recently dropped from an all-time high of 19,500 people in 1940 to about 9000 people in 1960 (Peach and Poole n.d.a: 9).

CHAPTER 6

PHASE I RESEARCH DESIGN AND INVESTIGATIVE STRATEGIES

Rain Vehik

The 1978 investigations at the proposed Clayton Lake constitute Phase I of a two phase mitigation program. Therefore, it is necessary to structure the research design within the framework of mitigation requirements, but still allow the collection of data necessary to understand culture process and human adaptation in the Jackfork Creek Basin.

RESEARCH DESIGN

The basic research goal is to provide a preliminary understanding of settlement-subsistence patterns in the project area in order to correlate these with adjacent areas. This perspective will provide a better understanding of how people used their natural environment. Of special concern will be the dispersal of populations and their activities within the Jackford Creek Basin, their locational patterns, methods of extracting energy from the natural environment, and why these patterns change. As a result, the following research design forms the basis for the 1978 archaeological investigations.

Chronology of Site Occupations

The development of an adequate chronology of events occurring within and between sites is basic to understanding the prehistory of the valley. This is necessary because the interior portion of the Ouachita Mountains is relatively unknown archaeologically and it is assumed that the cultural sequences are tied to developments outside the Ouachitas, probably the Red and Arkansas River Basins. Bobalik (1977: 555-574) established a five part sequence for the project area. However, this, to a large degree, was based on relative dating since only two radiocarbon determinations were obtained.

The development of a chronological record will be dependent on absolute dating. The collection of samples for absolute dating from the excavations will be of utmost concern. These include radiocarbon samples and samples for archaeomagnetic and thermoluminescence dating wherever possible. Relative dating techniques will be employed at sites and components from which samples for absolute dating could not be obtained.

Absolute dates provide a better control over occupational sequences and specific events (e.g., the construction and occupation of structures). They also provide a means by which to test relative dating techniques such as the use of trait clusters for segregating and comparing components, stratigraphic positioning of archaeological assemblages, and to understand lithic resource allocation and implement manufacture/maintenance systems (Galm 1978a: 35).

The Nature, Significance, and Function of Site Occupations

Based on previous testing, mitigative excavations of varying amounts were recommended for 15 of 38 sites (Bobalik 1977: 575). Because of limited time and funding, this number was reduced to six sites for Phase I investigations utilizing the following criteria: 1) Based on inferred age, sites were selected that covered the range of known temporal variation. 2) Based on survey data, sites were selected for their potential in providing information about settlement-subsistence activities. 3) Sites were chosen due to their topographic, particularly stream, position. 4) Given the preceding considerations, sites which would be directly impacted as a result of dam related construction activity were given priority. And 5), an attempt was made to avoid sites with extensive recent disturbance.

Each of the six sites is multicomponent. Four have Archaic components, five have Woodland components, four have early Caddoan components, and one has a possible late Caddoan component.

Stream position includes three sites on Jackfork Creek, two on Buffalo Creek, and one on Anderson Creek. All are on terraces. Several sites scheduled for Phase II cover flood plain occupations.

The fact that all of the sites are multicomponent and situated on different tributaries is significant because it will provide an opportunity to study diachronic change within the project area. However, it will also allow an examination of synchronic change over space within the Ouachita Mountain Province and related areas such as the Arkansas and Red River basins at various periods of time. Another significant aspect of the work, once more data has been compiled, is that it will allow direct comparisons of prehistoric occupations between the Ozark and Ouachita mountains. These areas in many ways are similar, and it has been suggested that late prehistoric occupations of the Ozarks' may represent cultural continuity (cf Purrington 1971; Vehik 1978). The full realization of this type of approach cannot be achieved at the present time since adequate data are not available. However, the investigations in the proposed Clayton Lake area are an important first step in achieving this goal.

The range of activities conducted at these sites include hunting, lithic reduction, vegetal procurement and processing, and storage. A major aspect of these studies will be an attempt to determine the kind, function, and permanency of site occupations.

It has been argued that societies are often differently organized for special purposes. For example, a small activity group which has separated from the larger group will often be uniquely organized for this special purpose. This has been referred to as a structural pose (Gearing 1962: 15). Quite often these poses may be controlled by environment, isolation, availability of personnel, and task performance requirements (Hill 1970:3). Bobalik (1977; 1978) has suggested, primarily on the basis of a lithic reduction continuum, that many sites in the project area are either base camps or special purpose (extraction) sites.

A number of approaches will be used in determining the types of activities being conducted at the sites. The testing program (described later in this chapter) will be established in such a way as to obtain a large sample of material culture remains across sites. This will be accomplished by excavating randomly selected squares. Another aspect of the testing program, designed to provide information about site functions, will be the recovery of features (especially rock concentrations, pits, and evidence of structures) and the determination of activity areas.

Base camps may either be long or short term and may represent seasonally determined sites or multiseasonal occupations (Bobalik 1978: 4-5). These sites serve as a base of operation from which other activities may be initiated, and are often referred to as maintenance sites (Schneider 1974: 14). It is not believed that they represent year round permanent occupations even though they may be characterized by having greater material culture densities which may reflect more generalized activities and varied tool inventories. If the sites are close to lithic resources, all stages of the lithic reduction sequence should be represented, however, implements and artifacts related to later stages of the reduction sequence should be more numerous. In addition, fire hearths, storage and/or trash pits, and temporary structures may be present (Bobalik 1978: 4).

Special purpose (extractive) sites are more limited in the sense that they reflect specialized activities related to the exploitation of natural resources. These sites may be seasonally determined and the artifacts should relate to a primary extractive activity, even though evidence of other activities may also be present. These sites (hunting camps, processing sites, kill sites, vegetal procurement sites, etc.) are primarily used in the acquisition of particular goods and may be characterized by relatively thin cultural deposits which may be horizontally restricted. Also, the entire lithic reduction continuum is not expected to occur at these sites and should be confined mostly to latter stages of the sequence. Hunting and/or butchering sites may be characterized by complete or broken implements necessary for these activities and some evidence of tool maintenance should be present. On the other hand, broken artifacts representing initial and primary modification stages of the lithic reduction sequence should be present at lithic procurement sites. Evidence of maintenance activities should be minimal and secondarily modified and finished implements should be infrequent or possibly broken due to manufacturing errors. Exploitative sites involved in collecting or processing floral resources should not exhibit much of the lithic reduction sequence and most of the assemblage should be comprised of broken or complete specimens required for vegetal procurement. These may

include cutting, scraping, grinding, and/or crushing implements. Cultural features such as structures and storage or trash pits may be infrequent but fire hearths and activity areas for butchering, resource processing, or lithic reduction may be recognized (Bobalik 1978: 4-5).

A functional analysis of the artifact assemblages will also be important in understanding the types of activities being conducted at each site as well as assisting in understanding the nature and kind of site occupations. Essentially, a qualitative functional approach similar to those used by Fowler (1959), House (1975: 55-73), McMillan (1971), and Winters (1969) will be utilized. However, in some cases functional attributes such as wear and breakage patterns will be used. Also, the modification of specimens at various stages of the lithic reduction continuum may be functionally sensitive.

In addition to the archaeological investigations, a number of specialized studies will be utilized to provide supplemental data related to the overall research design. These include:

1. Geological/geomorphological studies will focus on the field identification of soils and stratigraphy at the sites included for investigation. Interpretation of sediments will require the investigation of terrace systems in the project area as well as Holocene age deposits. Some emphasis will be placed on determining the relationship between Holocene deposits and prehistoric/historic settlement of the study area. Stratigraphic correlations will be attempted where possible in order to examine the nature and development of cultural sequences and geologic processes. Stratigraphic and topographic maps will be prepared at each investigated site.

2. Mechanical and chemical analyses of soils at selected sites will be conducted to assist in the identification and interpretation of the origin, mode of deposition, age, and physical characteristics of sediments at the respective sites. Soil chemistry data may also add to an understanding of cultural activity or levels of activity at specific sites.

3. Pollen samples will be collected and submitted for analysis. Pollen sampling at the sites is intended to supplement a larger palynological study involving the coring of selected lakes, bogs, or swamps in subsequent investigations.

4. Biological studies will focus on the determination of plant and animal resources utilized by the prehistoric/historic occupants of the study area. Biological remains, including human remains, will be collected, processed, and analyzed whenever possible. Recording and recovery techniques at the sites investigated are designed to maximize biological data recovery and will include flotation and waterscreening of soils.

5. An overview emphasizing historical resources in the project area and attempting to place them in a biocultural perspective will be prepared.

INVESTIGATIVE STRATEGIES

This section describes the overall excavation procedures and laboratory techniques for the project. The reader is referred to Chapters 7-14 for site specific excavation techniques.

Field Techniques

Phase I archaeological investigations are considered by the U.S. Army Corps of Engineers, Tulsa District as "excavation to the point of diminishing returns". Essentially, the following considerations necessitate the development of a proportional sampling strategy rather than attempting to totally excavate any one site included for Phase I investigations: 1) limited time and funding; 2) the information on each site provided by Bobalik (1977), particularly data relating to site boundaries and activity zones; 3) the desire to provide broad coverage of each site to avoid severely biasing investigation results; 4) the need to provide an internally consistent and externally comparable sampling strategy; 5) the preliminary nature of the previous investigations argues for controlled testing rather than excavation as an initial evaluative method; and 6) the sampling strategy employed must be able to accomodate modifications made in the field which are based on observations of archaeological significance.

The sampling design which has been developed can basically supply all of the information required of the Phase I program. Essentially, it involves the determination of excavation units through random and non-probablistic sampling.

The initial step in the design involves the selection 40 m square blocks (40 m^2) at each site to be investigated. The number and placement of these blocks will be subjectively determined and will be based on information pertaining to site area and artifact densities provided by the 1976 testing program (Bobalik 1977). These blocks, any additional excavations, and all measurements will be oriented to magentic north.

Once the 40 m^2 blocks have been superimposed over the sites, each block will be divided into sixty-four 25 m^2 sub-blocks. These sub-blocks will then be assigned a number beginning with the first in the southeast corner of the 40 m^2 block. These numbers will be sequentially arranged in a manner similar to that used in assigning section numbers on U.S.G.S. topographic maps (Fig. 7). Following this, 12 sub-blocks will be selected for further consideration through the use of a random numbers table.

Each sub-block contains 25 one meter squares which will be numbered in a manner similar to that discussed above. Subsequently, one 1 m square will be selected for excavation through the use of a random numbers table from each of the 12 randomly chosen sub-blocks. This results in the random selection of 12 one meter excavation units in each 40 m^2 block. For example, if two 40 m^2 blocks are imposed on a site, 12 squares will be excavated from each block, resulting in the excavation of 24 one meter squares.

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THE PREHISTORY OF THE PROPOSED CLAYTON LAKE AREA, SOUTHEAST OKL--ETC(U)
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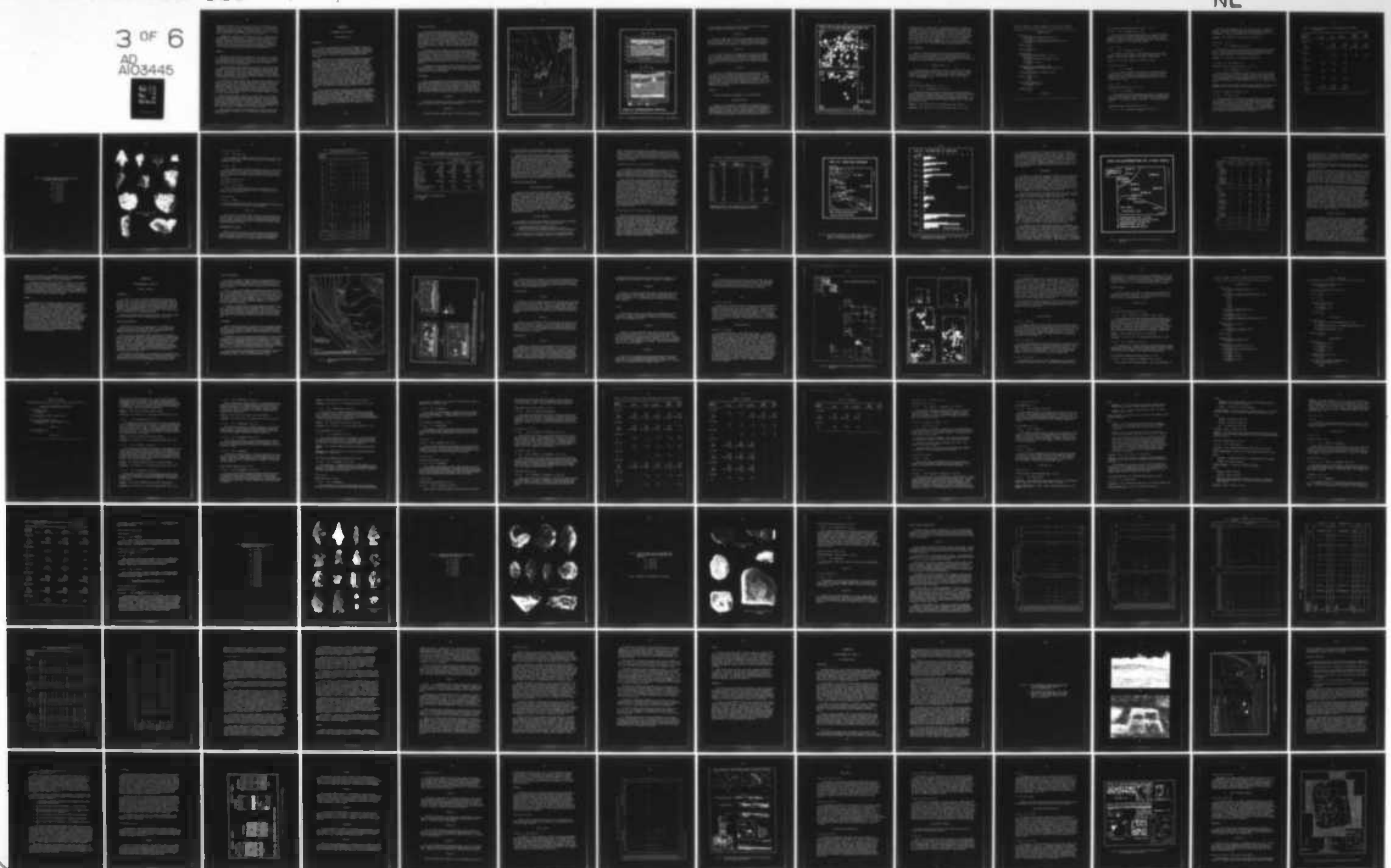

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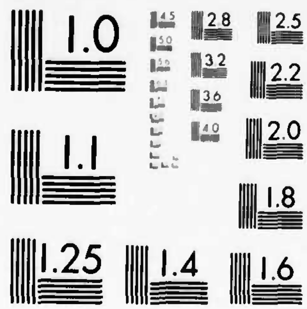


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

materials are present. The first cluster consists of clear glass bottle fragments *(07-01-01A)* and a .22 calibre slug *(07-03-07A)* in A53-10 within a gully near the terrace crest. The second cluster is in A17-15 and consists of ironstone dish fragments *(07-02-02C)* and metal scraps *(07-03-09A)*. These items reflect historic utilization of the lake area.

Segregation of components in the lower slope area is hampered by the shallow depth of cultural deposits. The upper two levels contain 86% of the flake debitage and 98% of the tools from the lower slope area. Presumably historic cultivation has disturbed most of the stratigraphic integrity of the lower terrace slopes. Most tool types have counterparts in the terrace crest area, and the same general components are believed to be deflated and represent the periphery of the occupation area.

SUMMARY

The Natural Lake site is on a prominent terrace adjacent to an oxbow lake approximately 500 m north of Jackfork Creek. The site is in pasture, but reportedly has been cultivated in the past. Other disturbances to the terrace include extensive rodent activity, sheet and gully erosion, and along the lower slopes, livestock wallows.

Excavations during 1978 concentrated on one of two high artifact density areas identified during the previous testing phase. Twenty squares were excavated to culturally sterile soil. Most randomly selected squares were along the lower slopes or near gullies where erosion has deflated cultural deposits. Consequently, this analysis focused on materials from 10 squares located along the terrace crest which contained the deepest cultural deposits and the greatest density of materials.

Most materials from the terrace crest represent Archaic components. The presence of an Early Archaic (Dalton) point found in the upper levels represents artifact reuse. Most artifacts from Stratum III suggest lithic procurement and manufacturing of chipped stone tools, processing of nut and other plant remains, hunting, and faunal resource processing activities. The function of the rock features exposed in the northwest portion of Block A is uncertain. The range of artifact types and features suggest an intermittently occupied base camp.

Artifacts associated with Strata I and II may reflect a Late Archaic occupation, although a single sherd and small points may indicate an ephemeral or specialized Woodland or early Caddoan component. The activity sets represented in the upper deposits reflect late stages of tool manufacturing, faunal resource processing, and to a lesser extent, floral resource procurement and processing. No features are attributed to the upper component. A short term base camp or procurement locality are postulated.

Historic materials from the site represent both livestock raising and short term camping. No major historic occupations are postulated for the terrace area.

CHAPTER 9

JEFF BROWN #1 SITE (34Pu-72)

Christopher Lintz

INTRODUCTION

This site is approximately 150 m east of the Natural Lake site (34Pu-71) and is along the same prominent terrace system. A wide gully separates the two areas and cultural materials at 34Pu-72 were observed in a 170 m by 100 m area on the terrace top along the east edge of the gully. This area is currently in pasture but reportedly has been cultivated.

The site was initially reported by Neal (1972: 4) and subsequently tested (Bobalik 1977: 237). There has been some confusion, however, regarding its designation and relationship to 34Pu-71. The locality considered herein is the same as Bobalik's 34Pu-72 (1977: 237) but corresponds to Neal's 34Pu-71 "eastern section" or "area A" (Neal 1972: 4). These reports have assumed that 34Pu-71 and 34Pu-72 represent a single linear occupation (Neal 1972: 4-5; Bobalik 1977: 237). However, the gully separating the two localities is 130 m wide and drains an 82,900 m^2 area, and is indicative of some antiquity. In addition, differences in temporally diagnostic artifacts and the total assemblage suggest that the localities were occupied at different times. An early component represented by *Meserve* and *Big Sandy* points was found only at 34Pu-72, and a prehistoric ceramic and historic component were limited to 34Pu-71. Contracting stemmed points have been found at both localities. Thus, it is believed that the burden of proof lies in demonstrating this to be a single site and separate site distinctions are made in the following study.

Initial testing at 34Pu-72 consisted of 15 post hole tests used to determine the depth and nature of subsurface deposits (Bobalik 1977: 241). However, additional excavations were recommended at 34Pu-72 because of its presumed relationship to 34Pu-71. Both were believed to represent base camps adjacent to Natural Lake, which is a relatively unique environmental setting in the Jackfork Basin (Bobalik 1977: 575). In addition, controlled excavations were recommended for 34Pu-72 in that it is one of the few sites in the valley containing materials suggestive of an Early Archaic component.

EXCAVATION STRATEGIES

The 1976 testing phase revealed that the "highest quantities of materials came from the westernmost postholes (Transect C-30 meters, Random Holes #1 and #5, and Datum Hole) located near the terrace crest" (Bobalik 1977: 249). These tests encompassed a 30 m^2 area. Consequently, a single 40 m^2 grid (Block A) was superimposed over the area (Fig. 20). The 12 randomly selected test squares were dry screened through ¼-inch mesh hardware cloth. A single waterscreen square (A58-18) was placed in the northwest portion of Block A near a randomly selected square containing the most cultural debris and with the greatest depth of cultural deposits.

The randomly selected squares were excavated in arbitrary 10 cm levels and continued until the flake count from a level dropped below 15 specimens. Because of soil hardness, two half levels (10 cm deep but half the square's area) were excavated to demonstrate cultural sterility of the deposits. A total of 36 full levels and two half levels were excavated between August 29 and September 1, 1978. The fill from the waterscreen square was excavated in 5 cm levels to provide greater vertical control.

Photographs and stratigraphic profiles were drawn of all test squares, and stratigraphic soil samples were collected. One angular rock concentration was treated as a cultural feature. All squares were backfilled at completion of the excavation phase.

STRATIGRAPHY

Five strata were observed in test square profiles with subtle color differences noted between the northern and southern squares. The northern test squares consistently had a more yellowish hue and orange chroma. This variation is believed to be the result of greater soil oxidation, perhaps from increased bioturbation in the northern area. The color differences (derived from dry samples) seem to have no cultural significance. Descriptions of Squares A58-18 and A22-16 are typical for the two areas (Fig. 21).

Stratum I

This horizon, confined to the top 2 cm, is composed of a brown humified organic matter mixed with a mineral sediment fraction.

Stratum II

This horizon ranges in depth from 2 to 10 cm and is characterized by

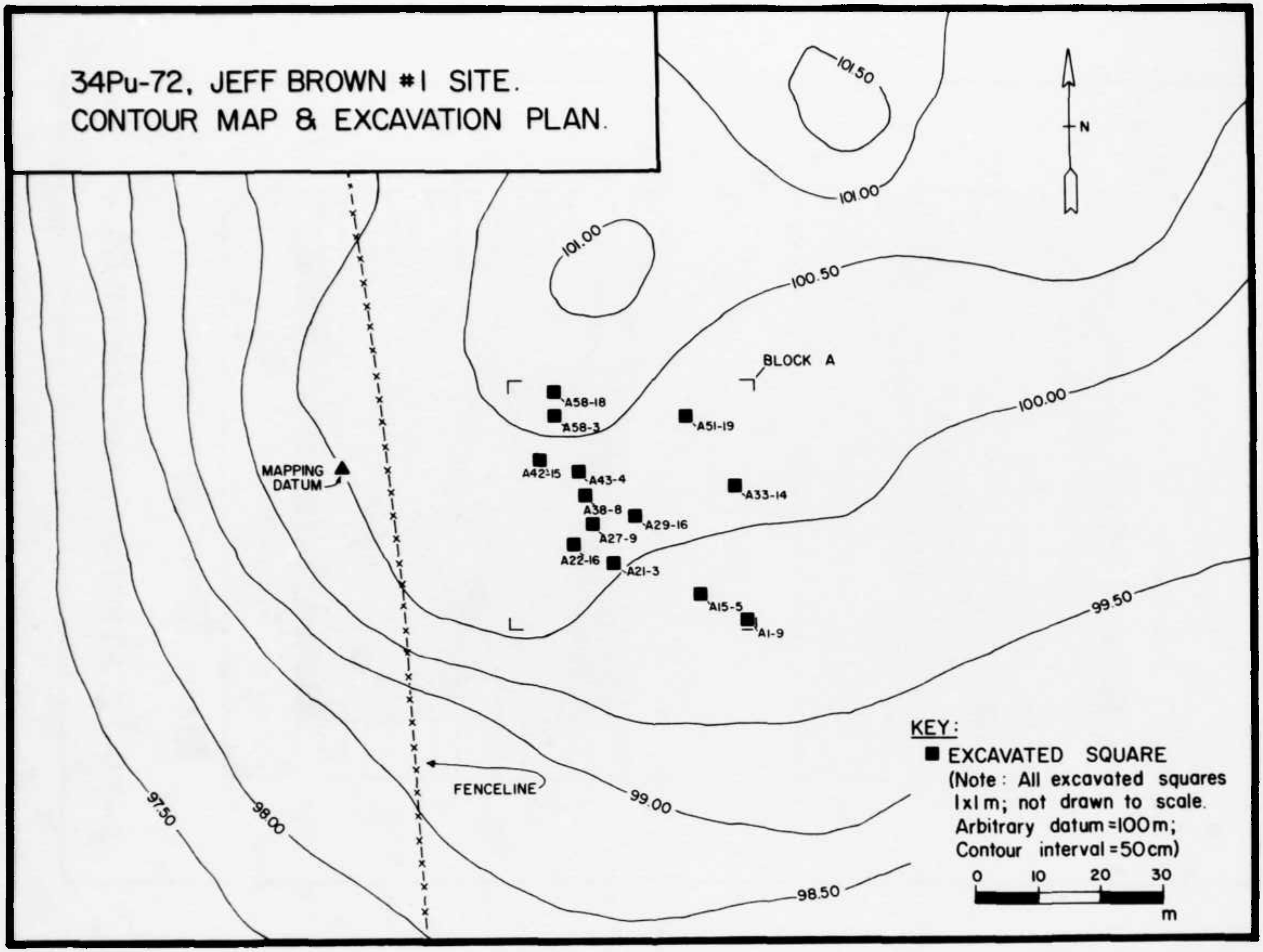


Fig. 20. Contour map and excavation plan of the Jeff Brown #1 site (34Pu-72).

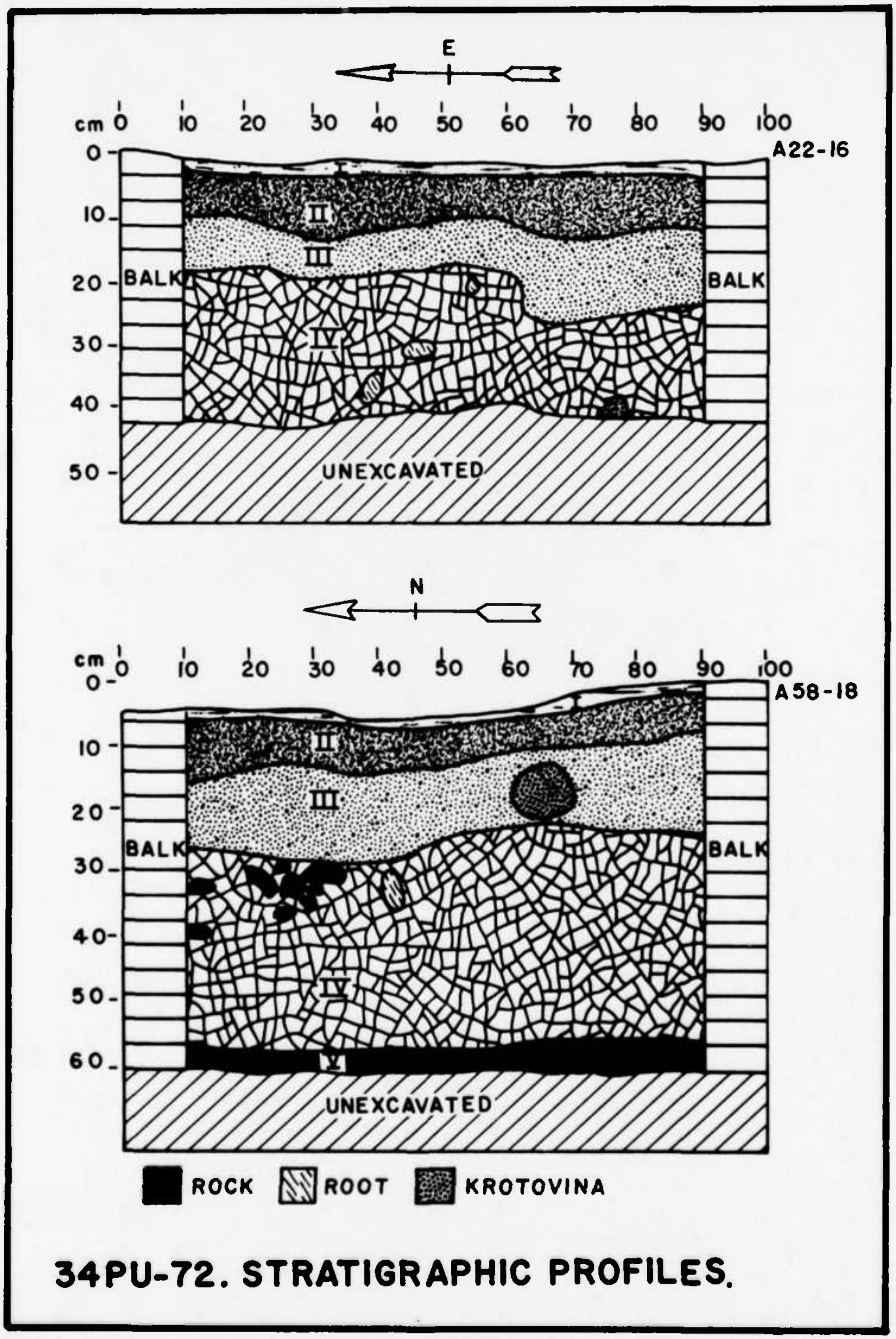


Fig. 21. Stratigraphic profiles from the Jeff Brown #1 site (34Pu-72).

a light yellow brown (10YR 6/4) to pale brown (10YR 6/3) fine sandy loam. Cultural materials are abundant in this stratum.

Stratum III

This unit ranges from 10 to 27 cm below ground surface in A45-18 and from 9 to 17 cm in A26-16. Colors vary from yellow (10YR 7/6) to very pale brown (10YR 7/4). The soil texture is still a fine sandy loam, but is more compact than Stratum II. Cultural materials are abundant.

Stratum IV

This compact sandy clay loam ranges from 17-27 cm to 54 cm below surface. There is a higher clay content than in the previous stratum. Colors range from reddish yellow (7.5YR 6/6) to brownish yellow (10YR 7/6). Cultural materials are still present and a burned rock feature was encountered in the uppermost portion of this stratum in the northern squares.

Stratum V

This unit is a compact fine sandy clay loam which ranges in color from reddish yellow (7.5YR 6/6) to brownish yellow (10YR 7/6). It is identical in color and texture with Stratum IV but differs as a result of the formation of pea-sized nodules of hematite concretions. It tends to be shallower in the eastern test squares, and a moderate amount of root and rodent activity is present throughout this stratum. This stratum contains very few cultural materials, and the recovered artifacts are believed to be intrusive.

FEATURES

One feature number was assigned to a rock concentration.

Rock Concentration

Feature 78-1 was located in the northwest portion of Block A, in non-contiguous test squares A58-3 and A58-18. It presumably extends into adjacent squares (Fig. 22). The size of the feature was not determined but the burned rocks encountered in random Post Hole No. 5 during the 1976 excavations may be part of the same rock concentration (Bobalik 1977: 247). The rocks occur between 28 and 42 cm below surface in A58-18 and

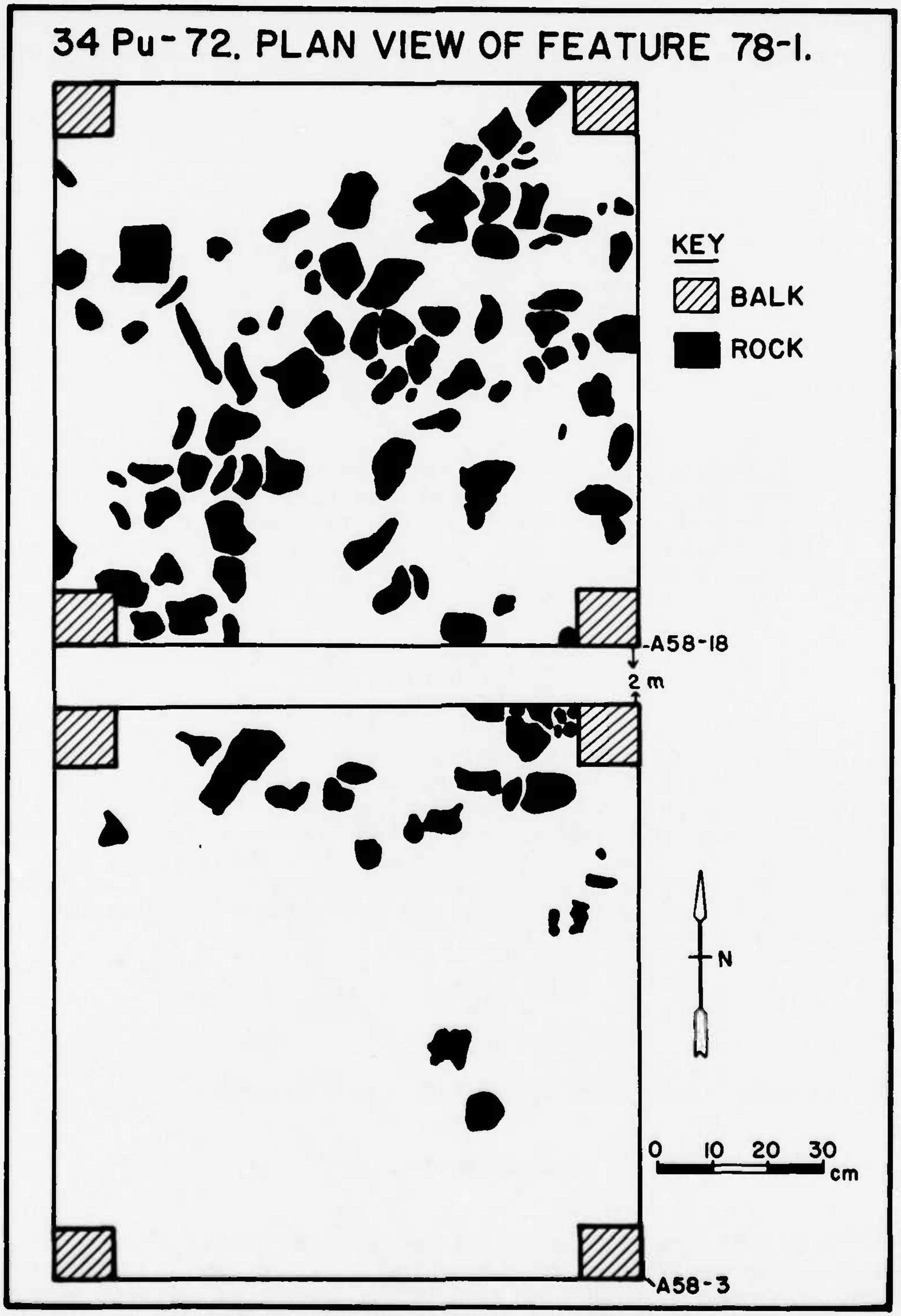


Fig. 22. Plan view of Feature 78-1 at the Jeff Brown #1 site (34Pu-72).

between 22 and 38 cm deep in A58-3. In both squares the rocks appeared as an irregular scatter of fist-sized, angular blocky pieces of sandstone and siltstone. Most are believed to be thermally altered and have gray to red exteriors with cracked and spalled surfaces. Very few spalls were found within the feature area. The surrounding soil matrix is a reddish yellow, fine, sandy clay loam with occasional flecks of wood charcoal. Associated artifacts include: one split cobble section (*01-15-01A*), three cobble/block biface II/thick biface specimens (*01-10-02A*), one thin biface I (*01-10-03A*), one contracting stemmed point (*01-01-01A*), one miscellaneous point fragment (*01-12-01A*), and two unifacially modified flakes (*01-13-01B*).

CULTURAL REMAINS

Materials recovered during 1978 were limited to Chipped Stone (*01*) and Floral (*09*) classes of materials. The descriptive format will follow the previously outlined sequence of class, group, category, and variety. A summary of artifact categories and varieties from the site are in Table 30. Metric data for the specimens are provided in Table 31.

Chipped Stone *(01)*

Only 32 specimens had evidence of bifacial or unifacial modification. The chipped stone groups include points *(01-00)*, scrapers *(05-00)*, backed bifaces *(09-00)*, bifaces *(10-00)*, miscellaneous biface implements *(11-00)*, point/biface fragments *(12-00)*, modified flakes *(13-00)*, split cobbles *(15-00)*, and debitage *(16-00)*.

POINTS (01-00)

Large Contracting Stemmed Points *(01-01-01)*

01-01-01A   N=3: 3 Fragmentary (Fig. 23 a-b)

These specimens have triangular blades, straight edges, prominent to rounded shoulders, and maximum width at the shoulders. Stems are contracting, bases are straight to pointed, and they have biconvex cross sections. The tip area on one specimen is rounded and has crudely worked sinuous edges in comparison to the fine edge work on the stem and base areas. These are made of Type A chert.

Comments: Points of this variety are comparable to the *Gary* type.

References: Bell 1958: 28, Pl. 14; Suhm and Jelks 1962: 197, Pl. 99.

Table 30. Summary of artifact categories and varieties from 34Pu-72.

Chipped Stone *(01)*

POINTS (01-00)
- Large Contracting Stemmed Points *(01-01)*
  - *01-01A*
- Large Expanding Stemmed/Corner-Notched Points *(01-02)*
  - *01-02U*

SCRAPERS (05-00)
- *05-01A*

BACKED BIFACE (09-00)
- *09-01A*

BIFACES (10-00)
- Cobble/Quarried Block Biface I *(10-01)*
  - *10-01A*
- Cobble/Block Biface II/Thick Biface *(10-02)*
  - *10-02A*
- Thin Biface I *(10-03)*
  - *10-03A*

MISCELLANEOUS BIFACE IMPLEMENTS (11-00)
- Cobble/Block Biface II/Thick Biface Tool *(11-02)*
  - *11-02A*

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)
- *12-01A*

MODIFIED FLAKES (13-00)
- *13-01A*
- *13-01B*

SPLIT/TESTED COBBLES (15-00)
- Split Cobbles *(15-01)*
  - *15-01A*

DEBITAGE (16-00)
- *16-01A*

Floral *(09)*

Large Expanding Stemmed/Corner-Notched Points *(01-01-02)*

01-01-02U N=1: 1 Fragmentary (Fig. 23 c)

The tip of this expanding stemmed specimen is missing but the blade is possibly triangular. Maximum width occurs in the middle of the blade. Edges are irregular, shoulders are pronounced but not barbed, corner-notching is broad, and it has a biconvex cross section. Extensive thermal spalling is apparent. It is made of Type A chert.

SCRAPERS (05-00)

01-05-01A N=1: 1 Complete (Fig. 23 g)

This artifact is triangular in form and has a plano-convex cross section. Steep unifacial retouch occurs along the distal end. Cortex covers the entire planar surface. It is made of Type A chert.

Comments: This specimen resembles a "keeled end scraper".

BACKED BIFACE (09-00)

01-09-01A N=1: 1 Complete

This is a thick, triangular shaped wedge. It has been bifacially worked along one lateral edge. Large flake scars are present on both faces but there is no battering or minute edge alteration. It has a sinuous edge. Cortex covers the entire back of this artifact, and it is made of Type A chert.

BIFACES (10-00)

Cobble/Quarried Block Biface I *(01-10-01)*

01-10-01A N-1: 1 Complete

This specimen has a thick irregular cross section, cortex covering most of the dorsal surface, little deliberate shaping, and several large flake scars on the ventral surface. The single, bifacially worked edge is sinuous. No extensive thinning is apparent. It is made of Type A chert.

Cobble/Block Biface II/Thick Biface *(01-10-02)*

01-10-02A N=6: 1 Complete, 5 Fragmentary (Fig. 23 h-i)

These are crudely shaped, ovoid in outline, with thick irregular cross sections. They have large flake scars but lack minute edge alteration. The edges are sinuous. Two specimens have cortical remnants occurring as small patches. Lithic types include five Type A and one Type B.

Comments: These specimens are associated with Feature 78-1.

Thin Biface I *(01-10-03)*

01-10-03A N=1: 1 Fragmentary (Fig. 23 f)

This artifact has a thin, plano-convex cross section and a trianguloid blade. There are regular flake scars, but minute edge alteration is not present. Edges are slightly sinuous, and there is no apparent attempt to prepare a hafting element. It is made of a Type B chert.

Comments: This specimen is associated with Feature 78-1.

MISCELLANEOUS BIFACE IMPLEMENTS (11-00)

Cobble/Block Biface II/Thick Biface Tool *(01-11-02)*

01-11-02A N=1: 1 Fragmentary (Fig. 23 j)

This specimen is a fragmentary mid-section which exhibits intermittent edge alteration along the lip of one break. The original biface has large flake scars, sinuous edges, and lacks edge alteration. One of two breaks has an overhanging lip. The edge alteration, indicative of usage as a tool, occurs intermittently on the face adjacent to the lip. It is made from Type A chert.

Comments: This item was presumably broken during the reduction sequence and has been recycled into the tool inventory without additional shaping.

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)

01-12-01A N=7 (Fig. 23 d-e)

This group consists of thin bifaces or points which are too fragmentary for classification. Four distal, two medial, and one proximal section are represented. All are thin bifaces which have been carefully shaped and have regular edges with fine edge alteration. The proximal section is a slightly expanding stem with a straight base. It may be comparable to a *Bulverde* or *Lange* type (Suhm and Jelks 1962: 169). Minute step fracturing along the stem break may represent attempts at thinning. Lithic types include five Type A, one Type B, and one Type H.

Table 31. Metric attributes for selected chipped stone varieties from 34Pu-72.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-01A					
$\bar{x}$	32.0	25.8	6.4	13.2	15.2
s.d.	-	5.8	1.5	0.8	0.3
range	-	20.0-31.5	4.5-8.1	12.4-13.9	14.9-15.4
N	1	2	3	2	2
01-01-02U					
$\bar{x}$	-	31.8	6.9	7.8	10.2
N	-	1	1	1	1
01-05-01A					
$\bar{x}$	43.3	33.8	11.0	-	-
N	1	1	1	-	-
01-09-01A					
$\bar{x}$	40.0	23.5	23.0	-	-
N	1	1	1	-	-
01-10-01A					
$\bar{x}$	53.2	29.4	19.4	-	-
N	-	-	-	-	-
01-10-02A					
$\bar{x}$	48.0	41.1	12.3	-	-
s.d.	0.8	10.7	3.0	-	-
range	47.2-48.7	30.5-57.3	8.6-16.6	-	-
N	2	4	5	-	-

Fig. 23. Selected chipped stone artifacts from the Jeff Brown #1 site (34Pu-72).

a-b: *01-01-01A*

c: *01-01-02U*

d-e: *01-12-01A*

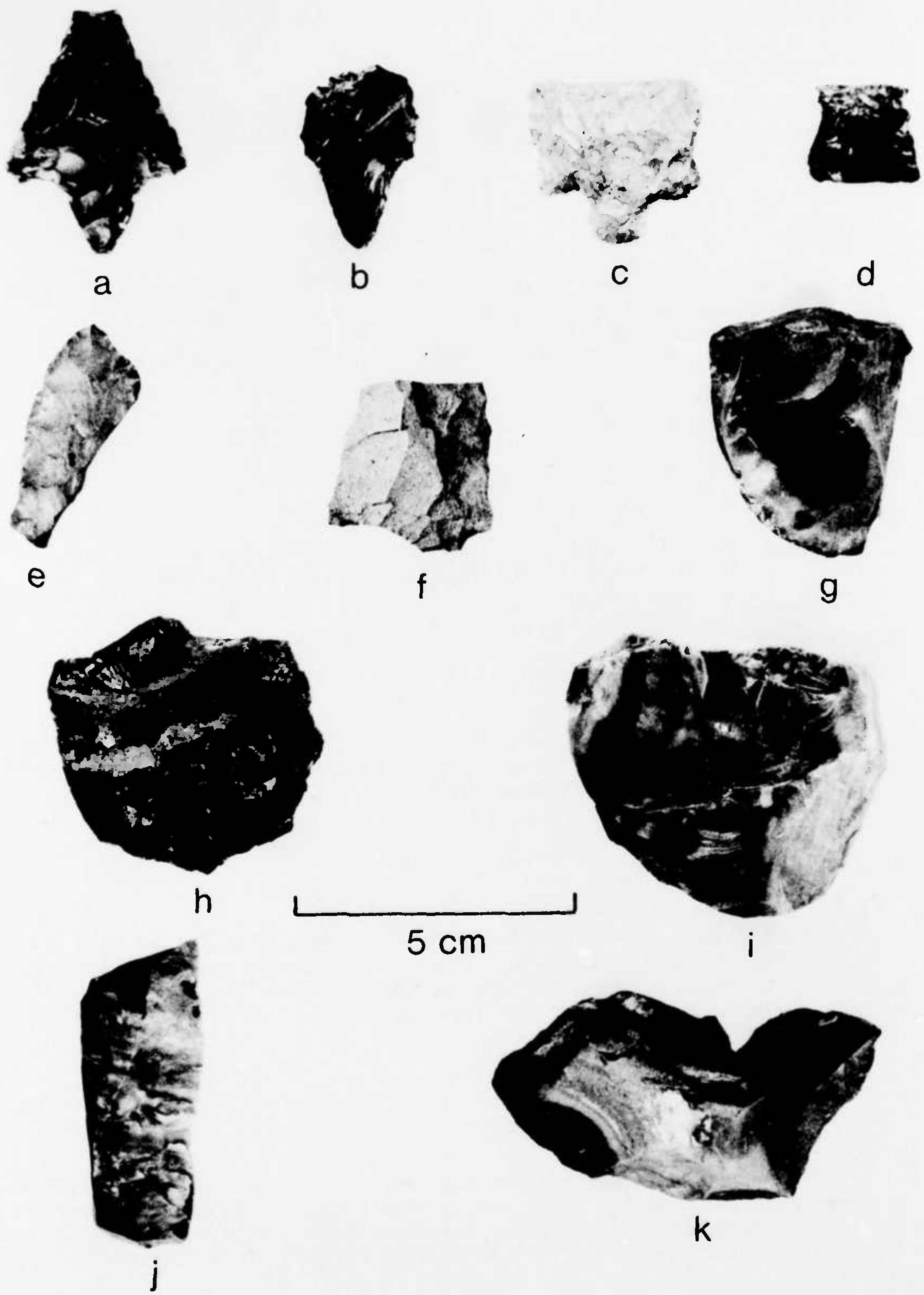
f: *01-10-03A*

g: *01-05-01A*

h-i: *01-10-02A*

j: *01-11-02A*

k: *01-13-01A*


a
b
c
d
e
f
g
h
5 cm
i
j
k

MODIFIED FLAKES (13-00)

01-13-01A N=1 (Fig. 23 k)

This specimen has a beaked projection accentuated by unifacial edge alteration on the ventral face along both sides of the projection. It is made of Type A chert.

01-13-01B N=8

These flakes exhibit minute edge alteration along one or more edges, and in one instance flake scars carry across the entire face. Edge alteration occurs on one concave, five straight, and two convex lateral edges. Lithic types include four Type A, two Type B, one Type H, and one Type J.

SPLIT/TESTED COBBLES (15-00)

Split Cobbles *(01-15-01)*

01-15-01A N=1: 1 Complete

This thick split cobble section has one flake removed from each face. Most of the dorsal surface has cortex. No edge alteration is present. The lithic type is A.

DEBITAGE (16-00)

01-16-01A N=1266

A total of 1266 unmodified flakes were recovered from the excavations, and have been sorted into raw material types (Table 32).

Floral *(09)*

Small flecks of wood charcoal were observed and collected from test squares A42-15, 58-3, and 58-18. None of the samples were of sufficient size for dating. However, the presence of charcoal in association with the rock features reinforces the idea of fire related activities in the northwest portion of the site.

WATERSCREEN RESIDUE SORTS

Residue from the waterscreen test square (A58-18) was sampled and sorted as a check on the kinds and amounts of materials missed by dry screening techniques (Table 33). The four levels sorted represent the matrix surrounding Feature 78-1 and natural strata II, III, and IV.

Table 32. Horizontal and vertical distribution of lithic debitage by material type from 34Pu-72.

Provenience (Square:Level) (10 cm)	A	B	C	D	E	F	G	H	I	J	K	Total
1-9												
1	23	2	-	-	-	-	-	4	-	4	-	33
2	36	6	2	-	-	-	-	1	-	6	-	51
3	19	1	-	-	-	-	-	2	-	6	-	28
4	6	2	-	-	-	-	-	-	-	-	-	8
15-5												
1	76	13	1	-	-	-	-	-	-	5	-	95
2	35	6	-	-	-	-	-	6	-	4	-	51
3	12	3	1	-	2	-	-	3	-	3	-	24
4 E½	3	1	-	-	-	-	-	2	-	-	-	6
21-3												
1	45	4	-	-	-	-	1	7	-	10	-	67
2	27	-	1	-	-	1	-	5	-	6	-	40
3	4	1	-	-	-	-	-	2	-	1	-	8
22-16												
1	79	4	1	-	-	-	3	11	-	15	-	113
2	27	5	-	-	-	-	-	2	-	-	-	34
3	16	1	-	-	-	-	-	4	-	-	-	21
4	6	-	-	-	-	-	-	4	-	1	-	11
27-9												
1	7	2	-	-	-	-	-	3	-	1	-	13
2	15	2	-	-	-	-	-	2	-	1	-	20
29-16												
1	13	4	-	-	1	-	-	-	-	-	-	18
33-14												
1	3	-	-	-	-	-	-	1	-	-	-	4
38-8												
1	5	1	-	-	-	-	-	-	-	-	-	6
2	2	-	-	-	-	-	-	1	-	-	-	3
42-15												
1	26	5	-	-	-	3	-	-	-	7	-	41
2	10	2	-	-	-	-	-	3	-	2	-	17
3	30	3	-	-	1	-	2	4	-	4	-	44
4	5	-	-	-	1	-	-	-	-	3	-	9
5	4	1	-	-	-	-	-	1	-	-	-	6
43-4												
1	20	-	-	-	-	-	-	-	-	1	-	21
2	15	1	-	-	1	-	2	3	-	-	-	22
3	5	2	-	-	-	-	-	2	-	3	-	12
4	10	2	-	-	-	-	-	-	-	2	-	14
51-19												
1	4	-	-	-	-	-	-	-	-	-	-	4
2	-	-	-	-	-	-	-	-	-	-	-	-
58-3												
1	71	16	-	-	-	-	-	11	-	6	-	104
2	121	9	-	-	-	1	-	17	-	22	-	170
3	40	3	-	-	1	1	-	12	-	5	-	62
4	35	5	-	-	-	-	-	5	-	8	-	53
5	15	-	-	-	-	-	-	5	-	6	-	26
6 S½	5	-	-	-	-	-	-	1	-	1	-	7
Total	875	107	6	-	7	6	8	124	-	133	-	1266
%	69	8.5	.5	-	.6	.5	.6	9.8	-	10.5	-	100%

Table 33. Counts and weights of waterscreen sorts of selected arbitrary levels from square A58-18 at 34Pu-72.

	Arbitrary Levels			
Material	2 (5-10 cm)	4 (15-20 cm)*	6 (25-30 cm)*	8 (35-40 cm)
Sample Wt.	500g	489g	443.1g	500g
Gravel Wt.	481.3g	456.0g	425.3g	481.7g
Flakes Ct./Wt.	246/16.3g	416/11.5g	183/5.7g	247/7.2g
Charcoal Wt.	1.45g	0.95g	2.0g	1.2g
Nutshell Wt.	0.2g	0.35g	0.2g	0.2g
Seeds and Seed Parts Ct./Wt.	68/0.4g	22/0.1g	15/0.2g	8/0.1g
Bone Wt.	-	-	-	<0.1g
Miscellaneous Debris Wt.	.35g	20.1g	9.7g	9.5g
Stratigraphic Unit	II	III	IV	IV

*Includes material from feature 78-1.
Wt. = Weight
Ct. = Count

Sorting was limited to a 500 g sample of residue, but in two instances, the total residue from the level was less than the standard sample size.

Residue sorts reveal that organic material is limited throughout the levels sampled. These results are not unexpected since the site area is subject to alternating wet-dry cycles and the soils are moderately acidic. The nutshell and seed counts reflect fragmentary specimens which could not be identified. Charcoal is relatively scarce throughout the sequence. However, more charcoal was noted during excavation of this square than any other square at the site. The flake counts are considerably lower than those reported from sites in the Wister Valley (Galm and Flynn 1978). Presumably, less tool maintenance was occurring in this part of the site. The lithic counts fluctuate with depth and total flake weights generally drop with increased depth. The exception is Level 6, which consists of the fill associated with Feature 78-1. The decrease in both flake counts and weights for this level possibly reflects the decreased matrix volume surrounding the numerous rocks in the feature.

DISCUSSION AND INTERPRETATIONS

Lithic Resource Utilization

Unmodified flake debitage from the randomly selected test squares was sorted by lithic types to determine patterns of usage. Table 32 indicates that the majority of lithic types used at 34Pu-72 were obtained locally. Furthermore, the predominant lithic type was Type A (69.1%), followed by Type J (10.5%), Type H (9.8%), and Type B (8.5%). The remaining lithic types contribute only 2.2% of the total sample. These figures deviate slightly from lithic type percentages obtained for the tool categories. Type A constituted 75%, Type B 16%, Type H 6%, and Type J 3% of the tool categories represented. The sample size of the tools (N=32) may be subject to biases affecting small samples and the differences noted are not thought to be significant. Most of the tools could have been manufactured at the site.

Intra-Site Analyses

The material from 34Pu-72 were analyzed to clarify a series of problems regarding internal site structuring. These problems include:

1. How many components are present at the site?
2. What were the activities conducted and/or site function?
3. What are the cultural affiliations and age of the site components?

Since finished tools and objective pieces from the reduction system were scarce and generally not temporally sensitive, determination of the

number of components was based on the horizontal and vertical distribution of flake debris. The types of activities conducted at the site were determined by the kinds and distribution of tools, lithic debitage, and cultural features. Finally, since no radiometric assays could be obtained, cultural affiliation and site age was based on a few temporally sensitive "diagnostic" artifacts.

HORIZONTAL DISTRIBUTION OF MATERIAL CULTURE

The horizontal distribution of debitage and artifacts is used to identify a number of areas with high concentrations of debris. If more than one concentration area is defined then it will be necessary to demonstrate whether the areas reflect temporally distinct cultural components or functionally different areas used within a single component.

Since each level unit was of a standard size and excavations generally terminated when flake counts dropped below 15 items, a series of concentration indices were calculated for each test square in order to make horizontal comparisons. The Concentration Index (CI) for each square was determined by dividing the sum of lithic debris from all levels of a square by the number of levels excavated (Table 34). Figure 24 suggests that two areas of debris concentration are present within the excavated portion of the site. The northern concentration includes squares A58-18, 58-3, and 42-15, and has a CI ranging from 23.4 to 76.7. The southern concentration includes squares A22-16, 21-3, 15-5, and 1-9 with a CI ranging from 30.0 to 50.3. The intervening area consists of squares A51-19, 43-4, 38-8, 33-14, 29-16, and 27-9. CI's ranged from 2.0 to 18.0. Since the area of low debris density is oriented perpendicular to the surface ground slope, recent erosion can be ruled out as an explanation for the separate concentration areas. The two concentrations appear to have cultural reality.

VERTICAL DISTRIBUTION OF MATERIAL CULTURE

The vertical distribution of debitage may stratigraphically indicate the number of components present at the site as well as the relationship between the two identified concentration areas. Figure 25 provides a bar diagram of the number of debitage items by level and square. Half level figures have been adjusted for comparability. This diagram graphically indicates that debitage in the two identified concentration areas have unimodal distributions in vertical flake counts. However, adjacent squares, A42-15 and 43-4, in the intervening area show a bimodal distribution. These data tentatively suggest that each concentration reflects a single occupation area, but stratigraphic differences in the intervening region (as indicated by the bimodal debitage distribution) may reflect temporally separate occupations of the site.

Table 34. Concentration indices for lithic debitage from 34Pu-72.

Square	Debitage Count	Number of Excavated Levels	CI	Concentration Areas
A 1-9	120	4	30	South
A15-5	176	3.5	50.3	South
A21-3	115	3	38.3	South
A22-16	179	4	44.7	South
A27-9	33	2	16.5	-
A29-16	18	1	18	-
A33-14	4	1	4	-
A38-8	9	2	4.5	-
A42-15	117	5	23.4	North
A43-4	69	4	17.2	-
A51-19	4	2	2	-
A58-3	422	5.5	76.7	North
A58-18*	441	5.5	80.2	North

*Waterscreen square. Levels adjusted to 10 cm. intervals; counts based on flakes not passing through ¼-inch mesh.

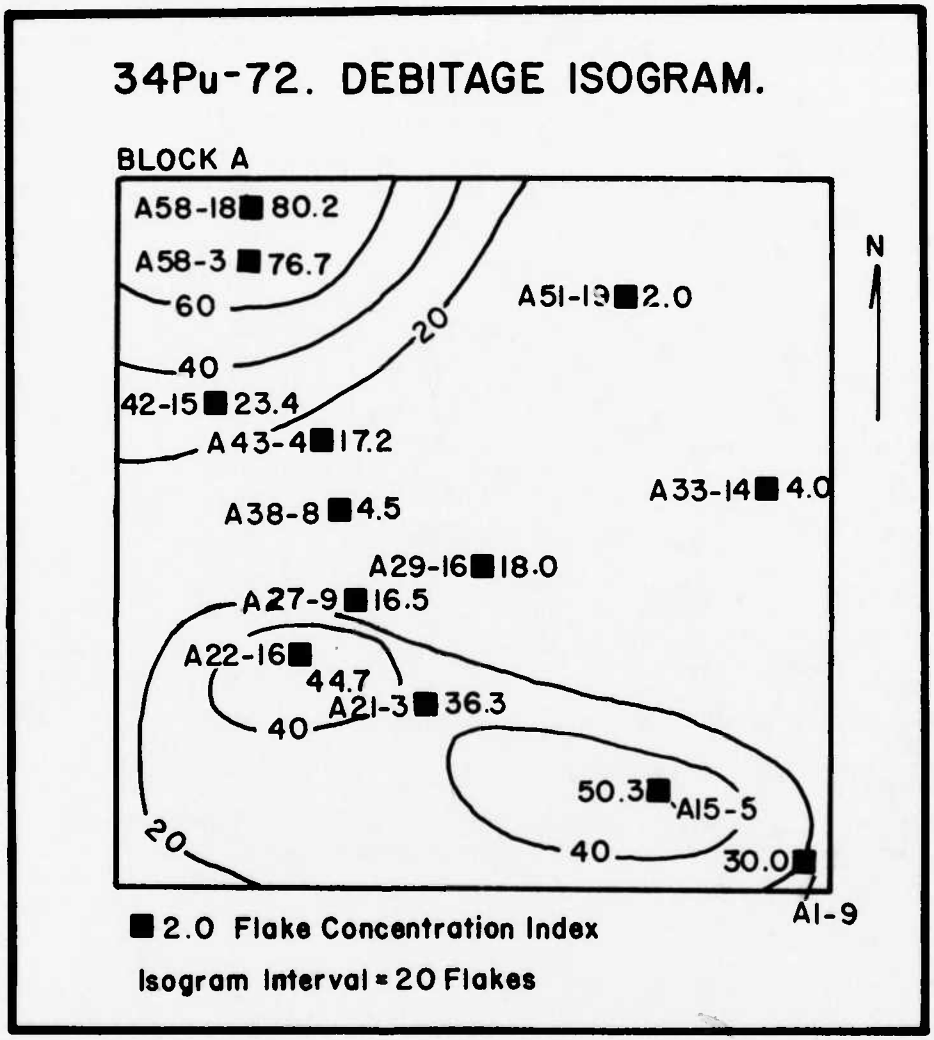


Fig. 24. Horizontal distribution of lithic debitage from the Jeff Brown #1 site (34Pu-72); 20 flake isogram intervals imposed over concentration index calculations.

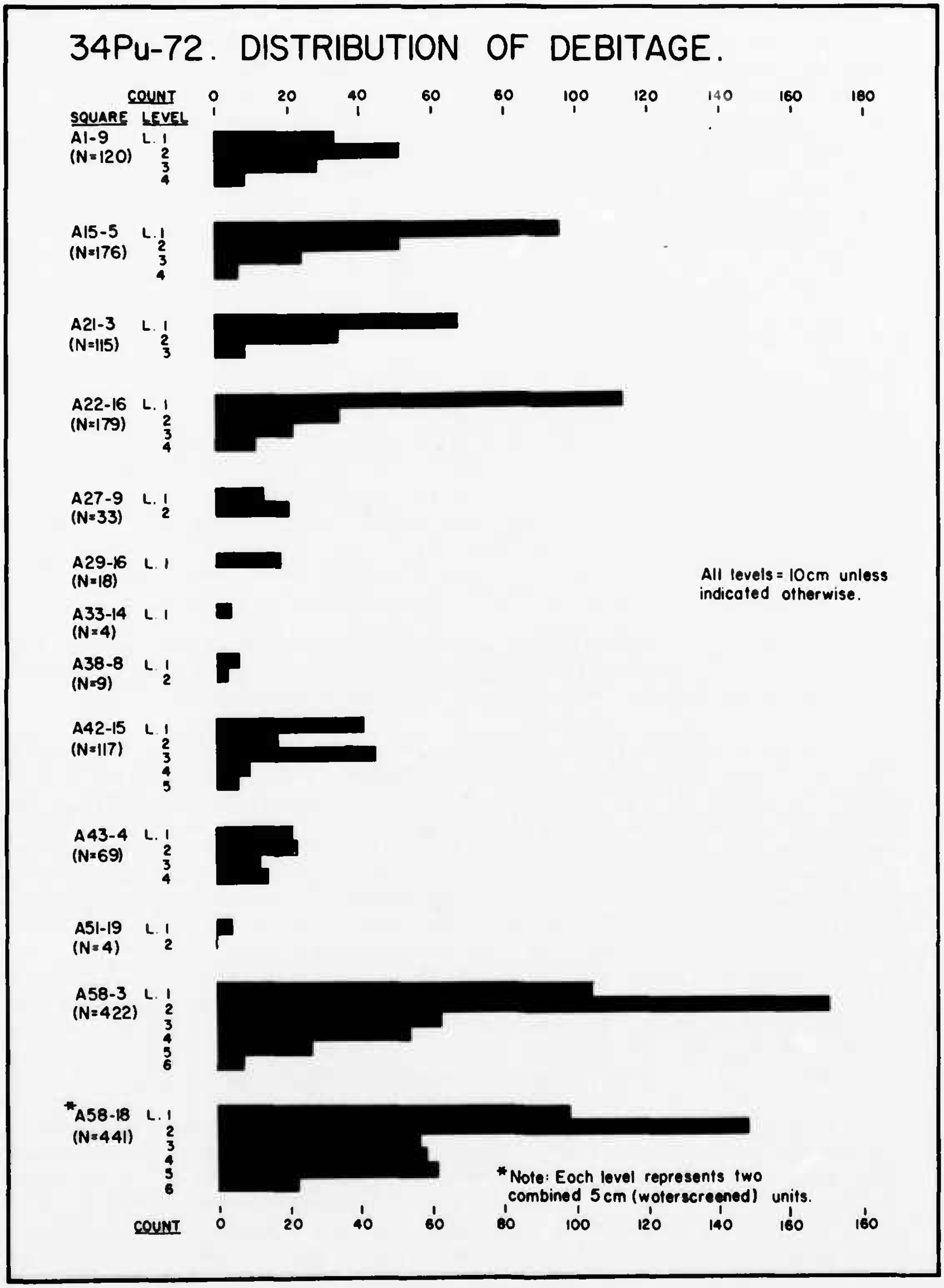


Fig. 25. Diagram showing distribution of lithic debitage at the Jeff Brown #1 site (34Pu-72).

The vertical distribution of debitage cannot be used to determine which of the concentration areas is earlier since cultural strata cannot be correlated across the unexcavated areas between squares. Unfortunately, the small artifact sample does not contain enough temporally sensitive forms to clarify stratigraphic relationships. Contracting stemmed points *(01-01-01A)* and expanding stemmed point fragments *(01-01-02A)* occur in both concentration areas. Although different temporal occupations of the site are suspected, the available evidence does not indicate which area was occupied first.

Site Function

The possibility of multiple occupations at 34Pu-72 does not necessarily mean that similar activities were conducted. Each site in the valley may have numerous environmental and ecological variables which may enhance or diminish its desirability for occupation. The actual and perceived variables may change rapidly (seasonally) or gradually over a number of years. Consequently, diverse groups may be attracted to the same site for various reasons which result in differing activities. These differences may be spatially separate and should be apparent from the correspondence of specific tool categories and cultural features within each site.

Figure 26 indicates that the horizontal distribution of tools at 34Pu-72 corresponds to the identified lithic debris concentration areas. Furthermore, major differences are apparent between the two areas.

The south concentration area contains only lithic debitage *(16-00)*, modified flake tools *(13-00)*, and reworked or broken finished bifacial points *(01-00)*. Biface fragments *(12-00)* are conspicuously absent from the reduction sequence. This suggests that tool maintenance (resharpening and repair) was primarily being conducted in this area. This suggestion is supported by the high percentage of non-cortical flakes (88%) and the relatively small size of flakes as expressed by average weights (Table 35). The average flake weight for the south concentration area is only 0.6 g. The range of finished tools is limited to expanding and contracting stemmed points *(01-00)* and unidentified point blade sections *(12-00)* although the sample size is small. No functional studies have been conducted, but the points may have served as projectile tips or as cutting tools. The absence of charcoal and features also indicates a limited range of processing activities in the south concentration area.

By comparison, the north concentration area is far more complex. The burned rock feature (78-1) and flecks of charcoal were found throughout this area, and the range of finished tools was more varied. Thick biface tools *(01-11-02A)* and unifacial scrapers *(01-05-01A)* were found in this area in addition to points *(01-00)* and modified flakes *(13-00)*. This area is also unique in having a large number of bifaces *(10-00)* representing unfinished stages of the reduction sequence. Manufacturing and maintenance of stone tools were conducted in the north concentration area in association with a wider range of processing activities. These inferences are supported

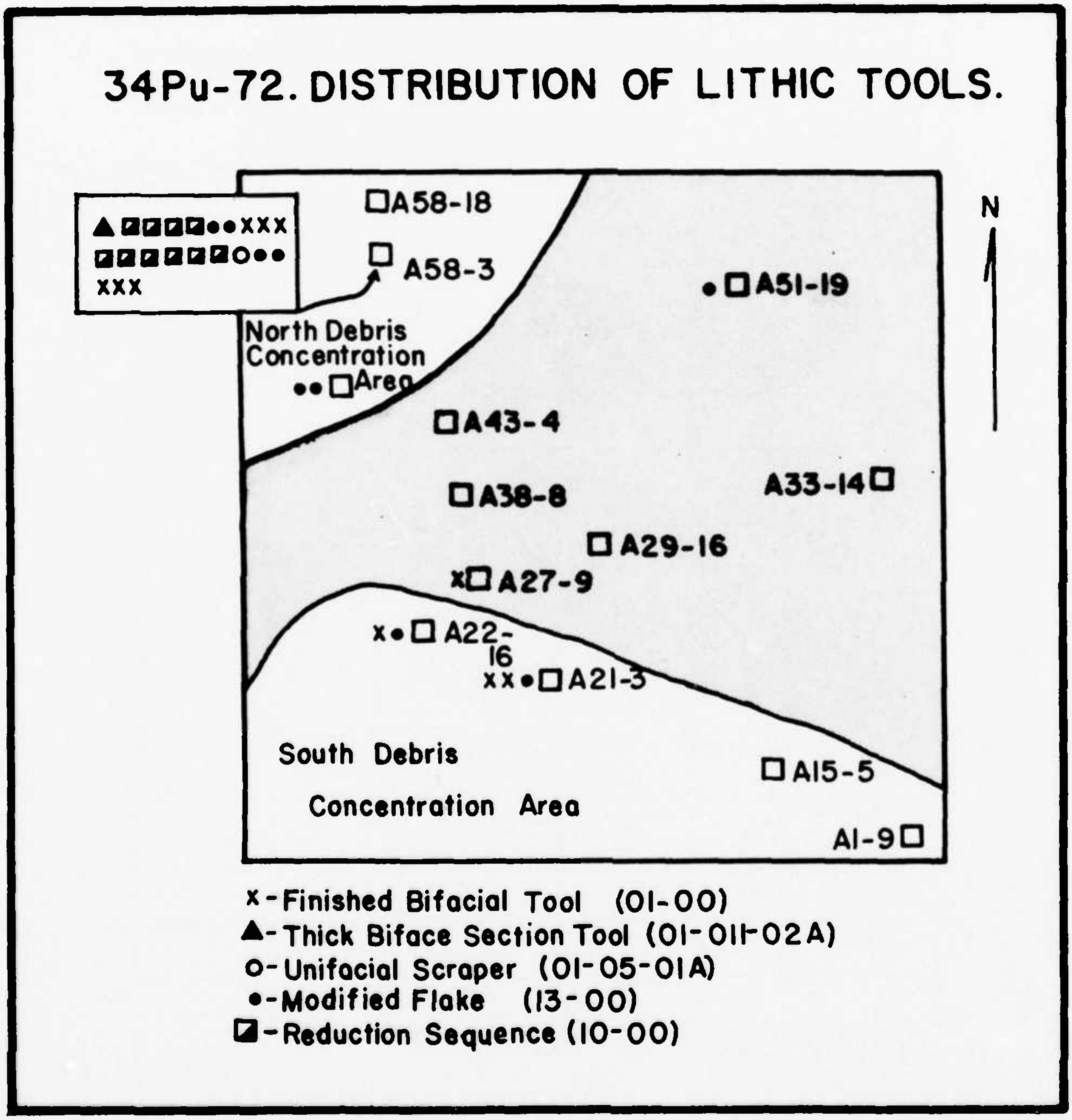


Fig. 26. Distribution of lithic tools at the Jeff Brown #1 site (34Pu-72).

Table 35. Horizontal and vertical distribution of flake types and weights from squares in the north and south areas at 34Pu-72.

Square/Level	Primary	Secondary	Tertiary	Total	Weight
North Area					
42-15					
1 (0-10 cm)	2	4	35	41	20.0g
2 (10-20 cm)	-	1	16	17	10.0g
3 (20-30 cm)	-	4	40	44	19.5g
4 (30-40 cm)	1	2	6	9	51.7g
5 (40-50 cm)	-	-	6	6	2.9g
58-3					
1 (0-10 cm)	3	16	85	104	70.0g
2 (10-20 cm)	11	26	133	170	145.2g
3 (20-30 cm)	2	7	53	62	86.3g
4 (30-40 cm)	6	8	39	53	65.3g
5 (40-50 cm)	2	5	19	26	66.8g
6 (50-60 cm) S½	-	1	6	7	6.0g
Subtotal	27	74	438	539	543.7g
South Area					
1-9					
1 (0-10 cm)	1	4	28	33	24.3g
2 (10-20 cm)	2	4	45	51	26.3g
3 (20-30 cm)	2	2	24	28	13.2g
4 (30-40 cm)	-	-	8	8	6.5g
15-5					
1 (0-10 cm)	4	9	82	95	65.5g
2 (10-20 cm)	1	2	48	51	25.0g
3 (20-30 cm)	-	4	20	24	21.1g
4 (30-40 cm) E½	-	2	4	6	4.7g
21-3					
1 (0-10 cm)	1	7	59	67	38.5g
2 (10-20 cm)	2	5	33	40	27.8g
3 (20-30 cm)	-	1	7	8	5.5g
22-16					
1 (0-10 cm)	1	9	103	113	55.2g
2 (10-20 cm)	2	2	30	34	16.5g
3 (20-30 cm)	-	1	20	21	21.2g
4 (30-40 cm)	-	2	9	11	6.7g
Subtotal	16	54	520	590	358.0g
Total	43	128	958	1129	901.7g
%	2	6	42	50	

by larger flake sizes (1.01 g) and by a higher percentage (19%) of decortication flakes (Table 35). Therefore, the inferred activities for the north area include cutting and scraping of floral and/or faunal resources. The burned rock feature may also have been a part of the floral and faunal resource processing activities.

Both concentration areas seem to be specialized activity areas. The components at 34Pu-72 may represent either specialized activity sites or short term base camps.

This functional interpretation of 34Pu-72 varies somewhat from previous interpretations when the site was considered to be a part of 34Pu-71 (Bobalik 1970: 281-282). The combined sites were believed to represent short or long term base camps at which hunting, vegetal processing and storage, non-vegetal processing, and lithic reduction were postulated. These activities were based on several items unique to 34Pu-71. These included pottery, ground stone mullers, small corner-notched points (Scallorn), and drills (Bobalik 1977: 281). None of these items have been recovered from 34Pu-72.

An examination of materials recovered only from 34Pu-72 during the previous survey and testing phases indicates that the inferred functional classes of materials are consistent with those recovered during the 1978 excavations. One contracting stemmed point and 111 pieces of debitage were recovered during the 1976 testing phase (Bobalik 1977: 253, 270). The artifact categories from the 1972 survey are not directly comparable since a fixed functional typology was employed. Most of the "knives", "preforms", and "bifacial scrapers" would probably be reclassified as biface fragments from the reduction sequence employed in the present study. The remaining implements represent points, utilized flakes, and one muller fragment (Neal 1972: 5). The muller is the only ground stone item recovered from the site. Its presence suggests that grinding of vegetal products may have occurred, but it was probably a relatively unimportant activity in terms of the total range of activities.

Cultural Affiliations

Due to the absence of datable materials the assignment of components to a specific cultural period relies on temporally diagnostic artifacts in the recovered assemblage. Unfortunately, only five point fragments were identified from the 1978 sample. Three fragments are contracting stemmed points *(01-01-01A)* and two are expanding stemmed points *(01-01-02A)*. There is no apparent difference between the two lithic concentration areas since both yielded contracting and expanding stemmed points. Large contracting stemmed points *(01-01-01A)* are a generalized tool form which is not particularly sensitive to temporal or cultural change. They were manufactured between 2000 B.C. and A.D. 1600 throughout the Middle and Late Archaic, Woodland, and Caddoan periods (Bell 1958: 28). It is tempting to assign the components to the early end of the continuum due to the absence of ceramics, small points, or other late diagnostic material. However, if 34Pu-72 represents a specialized processing site, then other

classes of late diagnostic tools might not be expected. Consequently, components within the excavated portion of the site were probably occupied intermittently during the 2000 B.C. to A.D. 1600 period.

The diagnostic material recovered earlier is consistent with materials found during the 1978 excavations (Bobalik 1977). However, *Meserve* and *Big Sandy* type points found during the initial survey suggest an earlier occupation. The absence of Early Archaic material from the subsequent testing and excavation phases at the site suggest that the early component may be outside the tested area, or that the early points represent antiquities carried to the site by later prehistoric occupants.

SUMMARY

Excavations at the Jeff Brown site (34Pu-72) revealed two flake and tool concentration areas. The south concentration area is believed to represent primarily stone tool maintenance activities conducted in conjunction with the processing of floral and faunal resources. Activities in the north area are more varied. The latter area contained a wider range of tools in association with a burned rock feature. Stone tool manufacturing and maintenance are postulated in support of scraping and cutting activities, and processing activities of floral and faunal resources. Slight stratigraphic differences tentatively suggest that each area represents separate occupation locales. In general, the site may have served as short term base camps or as specialized activity sites. Although temporally sensitive artifacts are scarce, contracting stemmed points *(01-01-01A)* indicate no major differences between the two areas. An Archaic through Caddoan occupation period may be posited. The 1978 excavations found no support for the Early Archaic occupation suggested by the 1972 survey, even though unidentified components may be present in unexcavated portions of the site.

CHAPTER 10

THE VANDERWAGEN SITE (34Pu-73)

Sheila J. Bobalik

INTRODUCTION

This site is on the first terrace approximately 100 m northeast of Jackfork Creek. Just south of the site, Jackfork Creek makes a bend to the east. The first terrace conforms to the general outline of the creek. The western terrace edge has been truncated due to high water erosion by Jackfork Creek. Several old meander scars are observable on the present floodplain. The Vanderwagen site is at an elevation of 565 feet (172 m) and will be submerged by the completion of the lake. This locale may be used as a borrow area for construction purposes.

The site was covered with high grass and briars. As a result, it was mechanically cleared of the dense vegetation prior to excavation.

PREVIOUS INVESTIGATIONS

During the 1972 survey, a limited quantity of lithic debris was collected from the site's surface (Neal 1972: 7). Only 17 post hole tests were excavated during 1976, and it was estimated that the site covered a 330 m by 75 m area (Bobalik 1977: 73-77).

None of the post hole tests yielded large quantities of material. Cultural remains were concentrated in two separate areas along the western portion of the terrace. Most of the material was recovered from the upper 30 cm of the deposits although some material was found as deep as 50 cm (Bobalik 1977: 76). These materials included several bifaces, a drill, three large points, and debitage. The points resembled *Gary*, *Ellis*, and *Uvalde* types which are usually associated with Archaic or Woodland components. It was proposed that this site represents a special purpose camp (Bobalik 1977: 80-81). Suggested activities included hunting, processing, and lithic reduction.

More extensive investigations were undertaken at the Vanderwagen site since it would be directly impacted by lake construction and because of the limited nature of the 1976 testing program. In addition, the site may provide information on Archaic and/or Woodland special purpose camps.

EXCAVATION STRATEGIES

The overall excavation strategy has been discussed in Chapter 6. Two 40 m^2 blocks oriented to magnetic north were superimposed over areas believed to have high material densities (Fig. 27). Block A was 40 m north of Block B, and a permanent datum was established at the northeast corner of Block A.

Twelve 1 m squares were randomly selected from each block for excavation. One random square from each block (A10-24 and B28-19) was designated as the waterscreen unit and excavated in 5 cm arbitrary levels. All other squares were excavated in arbitrary 10 cm levels and the matrix was dry screened through ¼-inch mesh hardware cloth. In an attempt to discern the nature and extent of cultural features, additional 1 m squares were excavated in both block areas. Twenty-five squares in Block A and 15 units in Block B were excavated.

In some cases, when the matrix was very compact, half levels (1 m X .5 m X .1 m) were excavated to verify suspected cultural sterility. Sixty-eight complete and five half levels from Block A and 55 complete and eight half levels from Block B were excavated. Matrix from six complete 5 cm levels from Block A and 11 complete 5 cm levels from Block B were waterscreened. All excavation units were backfilled before leaving the site.

STRATIGRAPHY

Several discontinuities were recognized in the stratigraphic sequence at 34Pu-73. Soils from Block B and portions of Block A probably reflect similar pedogenic histories. However, it was not possible to laterally correlate the stratigraphic units from the two block areas since they are separated by 40 m.

Examination of the soils from the area between Blocks A and B indicated extensive erosion which exposed the underlying substrata. This natural stripping and the subsequent reweathering of the underlying soil resulted in a bisequel soil development for this area of the terrace. It appears that slope wash filled in the eroded area although it can still be detected (Fig. 27). It is possible that during occupation of 34Pu-73 this division between the two loci was more pronounced as a result of erosion.

To facilitate analysis, descriptions of the stratigraphic units distinguished for Block A will be followed by those for Block B. Color determinations (Munsell 1975) are derived from moist samples.

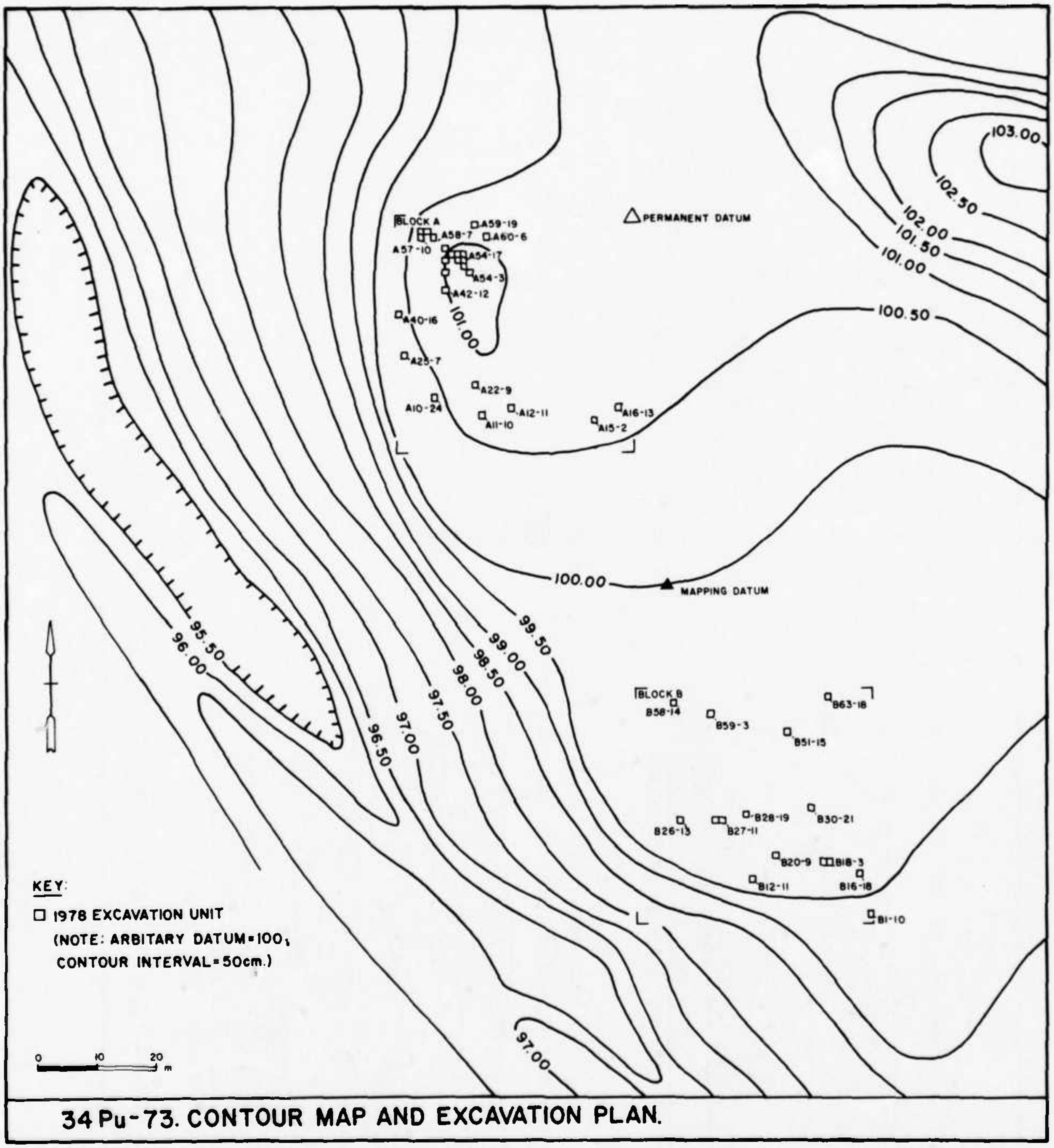


Fig. 27. Contour map and excavation plan of the Vanderwagen site (34Pu-73).

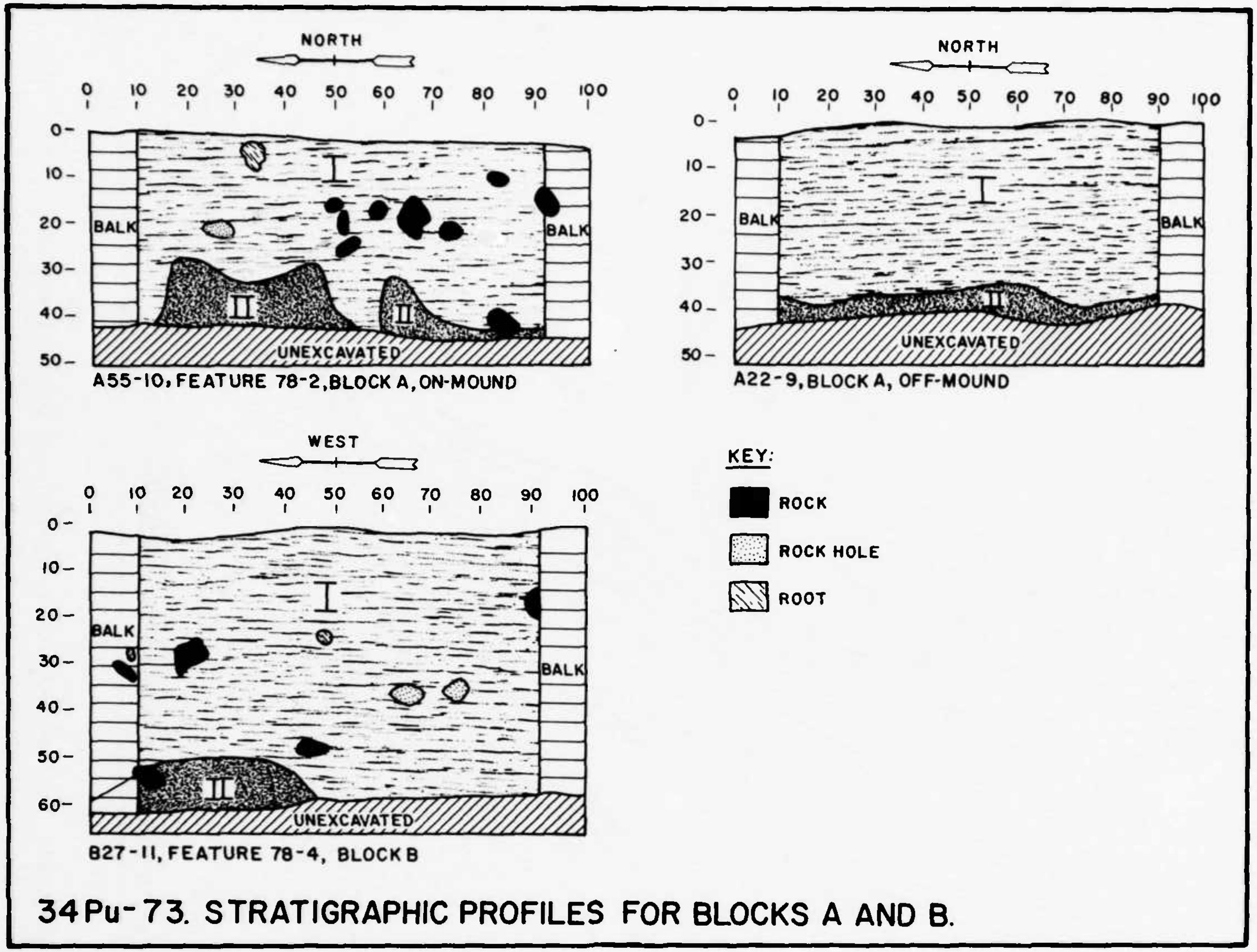


Fig. 28. Stratigraphic profiles for Blocks A and B at the Vanderwagen site (34Pu-73).

BLOCK A

A slight rise or natural mound is apparent in the northwestern portion of Block A. Noticeable soil differences are observed on and off this natural mound. Strata will be discussed according to this on/off-mound division. Profiles from on-mound (A55-2) and off-mound (A22-9) squares are representative of the Block A sequence (Fig. 28).

Off-Mound Strata

Stratum I

Stratum I is a porous brown/dark brown (10YR 4/3) sandy loam restricted to the off-mound portion of Block A (Fig. 28). It represents the upper unit for this portion of the block area. Vertical thickness ranges between 10-38 cm and is generally thinner along the western terrace edge. Small, well sorted gravels and many rootlets are present. Disturbance from burrowing animals and roots (bioturbation) has been observed. Cultural materials are present.

Stratum II

Stratum II is a yellow brown (10YR 5/8) sandy loam confined to the off-mound portion of Block A (Fig. 28). It is more compact than the overlying stratum. Since this unit comprises the base of the profile exposures, observed vertical thickness varies between 6-36 cm depending on the depth of the excavation unit. Cultural materials are present in limited quantities and are believed to be instrusive.

On-Mound Strata

Stratum I

Stratum I is a porous very dark brown/dark brown (10YR 2/2-3/3) sandy loam restricted to the northern mound in Block A. For the central portion of the mound (A55-2), this stratum is restricted to the upper 35 cm of the deposit (Fig. 28). Along the western terrace edge, this unit is between 16-24 cm thick. Small, well sorted gravels and numerous roots and rootlets are present. Also, occasional charcoal flecks and pieces of burned clay are present. Many culturally derived cracked rocks (Features 78-2 and 78-6) are scattered throughout this stratum. Cultural materials are abundant.

Disturbance from burrowing animals, insects, and roots is evident. The wavy boundary of this stratum is believed a function of bioturbation.

Stratum II

Stratum II is a dark yellowish brown (10YR 3/4-4/4) sandy loam which is restricted to the Block A mound. This zone is more compact than the overlying stratum. This unit begins at 16-35 cm deep and continues at least to 40 cm (Fig. 28). Cultural materials are sparse and are believed to be intrusive.

BLOCK B

A slight natural mound is also present in the southwestern portion of Block B. However, no observable differences in the on/off-mound stratigraphic sequence are indicated. A profile from an on-mound square (B27-11) is illustrated (Fig. 28).

Stratum I

Stratum I is a porus brown-dark brown (10YR 4/3) sandy loam which is continuous over Block B (Fig. 28). Vertical thickness ranges from 8 cm off the mound to 56 cm at the center of the mound (B 27-11). Small, well sorted gravels and numerous roots and rootlets are present. Culturally derived cracked rocks (Features 78-1, 78-3, and 78-4) are scattered throughout this unit. Cultural materials are present. Disturbances from animals, insects, and roots are evident.

Stratum II

Stratum II is a yellowish brown-dark yellowish brown (10YR 5/6-4/6) sandy loam. This unit represents the exposed basal stratum. Thickness varies from 9-30 cm depending on the depth of the excavation unit. Cultural remains are infrequent and are most likely intrusive.

FEATURES

Six occupational features have been recorded from both block areas of 34Pu-73, and are restricted to the two mound areas. Two rock concentrations and a possible pit occur in Block A. The three rock features from Block B are distinctive from those in Block A. Features will be discussed according to their block locations (Figs. 29 and 30).

BLOCK A

Pits

Feature 78-5 (Fig. 29)

A possible pit is observed at 30 cm below ground surface at the bottom of Stratum I on the mound. This feature is semicircular in outline and appears to extend west and south into adjacent squares. However, this could not be verified when the adjacent units were excavated. The feature fill consists of a very dark brown (10YR 2/2) loose sandy loam with scattered flecks of charcoal and occasional sandstone fragments. It is surrounded by the dark yellowish brown silt loam of on-mound Stratum II. The dimensions are 90 cm by 60 cm by 3 cm (depth). The function of this feature could not be determined.

Rock Concentrations

Feature 78-2 (Fig. 29)

This rock concentration is associated with Stratum I. It lacks well defined boundaries, and covers much of the Block A mound. The feature is characterized by a loose scatter of angular sandstone fragments. Rocks are loosely dispersed between 7-35 cm below ground surface. Occasional rocks appear to have been thermally altered. Charcoal flecks (16.8 g) and burned clay are infrequently observed in the feature matrix. However, this matrix does not appear to have been burned in place. Rocks are generally 5-10 cm in diameter, and appear to be loosely dispersed across at least an 8 m by 5 m area. This culturally derived scatter may represent several depositional events but no discrete vertical units could be discerned during excavation. Figure 29 illustrates the rocks from the upper 10 cm of this deposit and is representative of the dispersed nature of this feature. Cultural materials including chipped stone, ground and pecked stone, ceramics, and lithic debitage are numerous. A sample of the charcoal (8.0 g) from this feature was submitted to the University of Georgia, Center for Applied Isotope Studies for radiocarbon analysis. A date of modern was determined from this sample (UGa-2531).

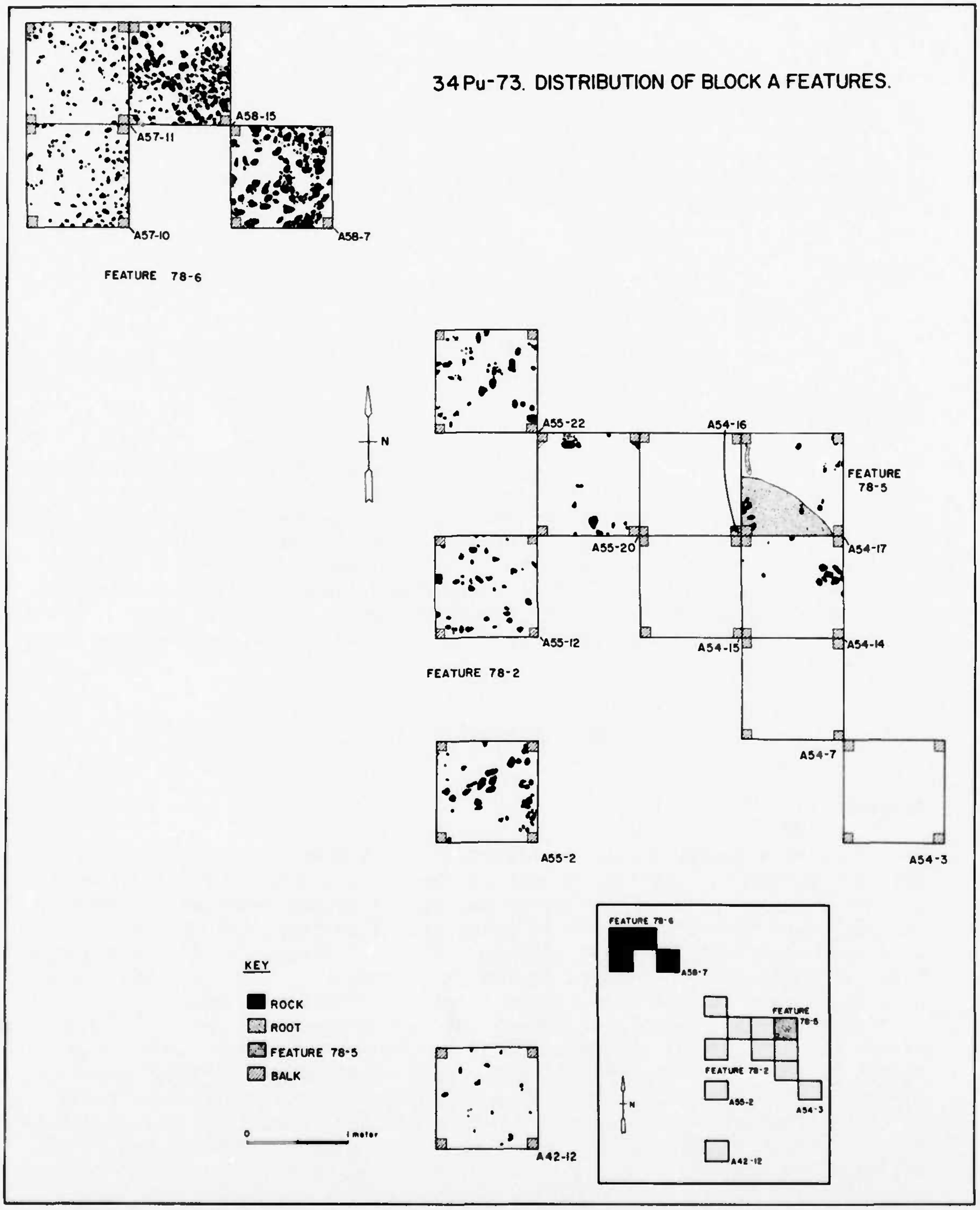


Fig. 29. Distribution of Area A Features at the Vanderwagen site (34Pu-73).

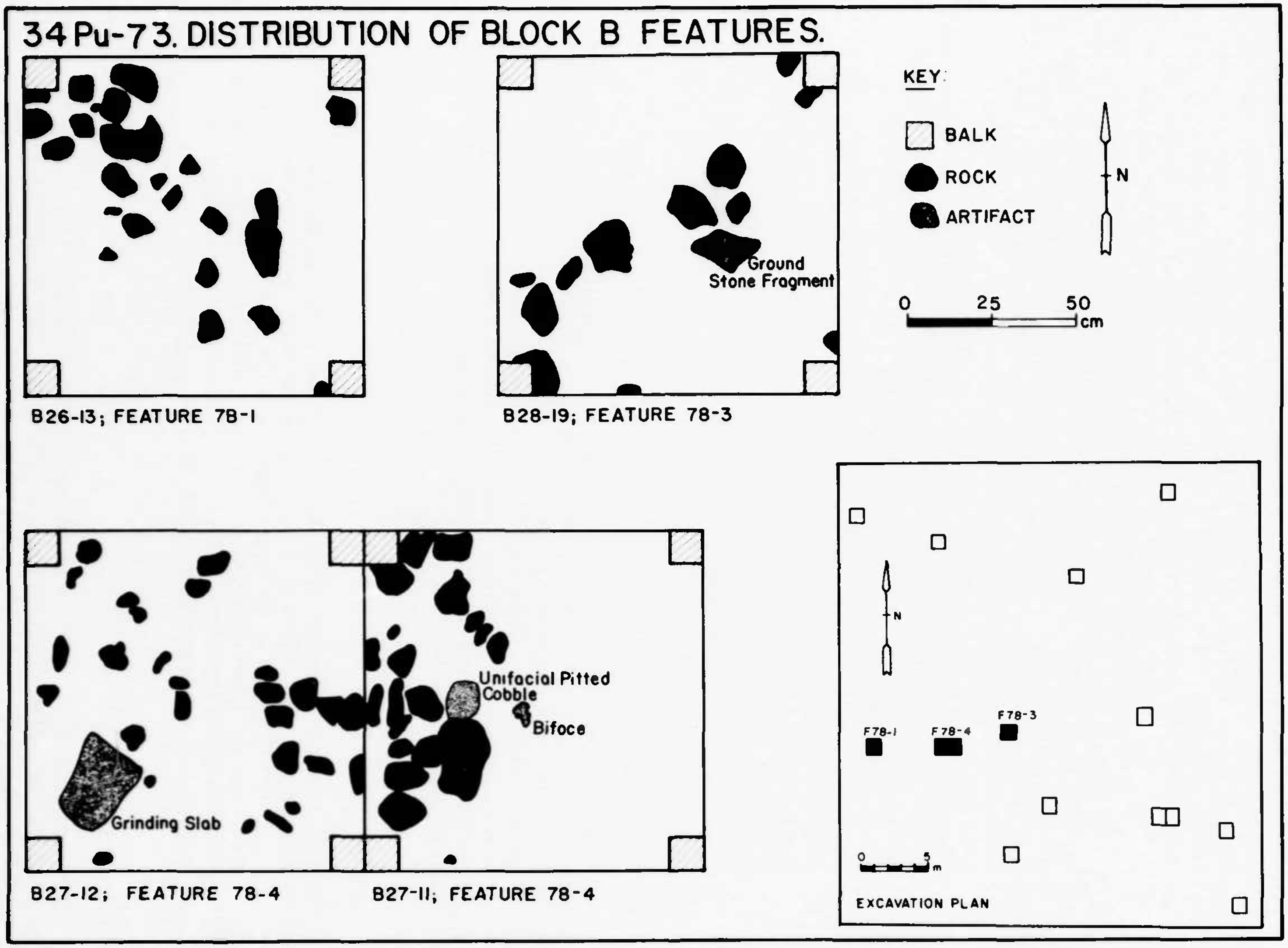


Fig. 30. Distribution of Area B Features at the Vanderwagen site (34Pu-73).

Feature 78-6 (Fig. 29)

This feature represents a dense concentration of sandstone fragments between 4-30 cm below ground surface. Many of these rocks are heat spalled and generally 5 cm or smaller in size. Occasional fragments range in size up to 10 cm in diameter. Infrequent flecks of charcoal and burned clay and a burned bone fragment were observed in the feature fill. The feature matrix does not appear to have been burned *in situ*. This concentration occurs in Stratum I and is restricted to the northwest edge of the Block A mound. It appears larger than the 3 m by 2 m area excavated since rocks continue into adjacent unexcavated areas. Rocks are not as dense along the western edge of the feature. Figure 29 illustrates the distribution of rocks in Level 1 and indicates the distinctive nature of this feature. Cultural remains are abundant and include chipped stone and debitage.

The function of the two rock features in Block A could not be determined. Although thermally altered rock, charcoal, and burned clay are represented, the associated matrix does not appear to have been oxidized. Feature boundaries are not well defined.

BLOCK B

Rock Concentrations

Feature 78-1 (Fig. 30)

This feature consists of a small cluster of angular sandstone fragments which occur between 16-34 cm below ground surface in Stratum I of Block B. These well sorted rocks generally range between 8-10 cm in diameter and none appear thermally altered. This diagonal scatter exhibits well defined boundaries and appears to continue into unexcavated areas. This cluster is located near the western edge of the Block B mound. No artifacts are associated with this feature.

Feature 78-3 (Fig. 30)

This well sorted cluster of broken sandstone rocks is located near the northeastern edge of the Block B mound and is between 35-45 cm deep at the bottom of Stratum I. The rocks range between 8-14 cm in diameter. This small cluster has well defined boundaries and continues into unexcavated areas. A cobble/quarried block biface I *(01-10-01)* and a ground stone fragment *(03-06-03)* are associated with this rock concentration.

Feature 78-4 (Fig. 30)

This moderate size cluster of broken sandstone rocks is between 39-60 cm deep at the bottom of Stratum I. These unburned fragments cover a

150 cm by 90 cm area. The well sorted rocks range between 8-14 cm in size although some are as large as 25 cm in diameter. This feature is located near the center of the Block B mound and displays well defined boundaries. Three thick bifaces *(01-10-02A)*, a unifacial pitted cobble *(04-02-01A)* and a grinding slab *(03-02-01A)* are directly associated with this feature.

CULTURAL REMAINS

The cultural material recovered from 34Pu-73 has been grouped into descriptive categories (Table 36). The various artifact varieties are presented below. Metric attributes for chipped stone artifacts are provided in Table 27 and ground stone in Table 38.

Chipped Stone *(01)*

POINTS (01-00)

Large Contracting Stemmed Points *(01-01-01)*

01-01-01A N=18: 7 Complete, 11 Fragmentary (Fig. 31 a-b)

These specimens have triangular blades and pronounced contracting stems. Maximum width occurs at the shoulders which range from prominent to weakly defined. Cross sections are biconvex (83%) and plano-convex (17%). Seven specimens have acute distal ends and five are rounded probably due to reworking. Impact fractures occur at the distal end of two specimens. Blade edges are straight (50%), concave (28%), or convex (22%). Base outlines are convex, straight, and pointed. Seventy-two percent have been reworked, generally at the shoulders or distal end.

Comments: These specimens are similar to *Gary* points.

References: Bell 1958: 28, Pl. 14; Suhm and Jelks 1962: 197, Pl. 99.

01-01-01C N=1: 1 Complete (Fig. 31 c)

This specimen has a triangular blade with straight edges and a narrow, slightly contracting stem. It has a thin biconvex cross section. Maximum width occurs at the shoulders which are weakly defined. The distal end is acute and the base is rounded. One shoulder has been reworked.

Large Expanding Stemmed/Corner-Notched Points *(01-01-02)*

01-01-02A N=3: 1 Complete, 2 Fragmentary (Fig. 31 d-e)

These artifacts have triangular blades. Edges on two specimens are

Table 36. Summary of artifact categories and varieties from 34Pu-73.

Chipped Stone *(01)*

POINTS (01-00)

- Large Contracting Stemmed Points *(01-01)*
  - *01-01A*
  - *01-01C*
- Large Expanding Stemmed/Corner-Notched Points *(01-02)*
  - *01-02A*
  - *01-02B*
  - *01-02C*
  - *01-02J*
  - *01-02N*
  - *01-02Q*
  - *01-02R*
  - *01-02V*
- Large Straight Stemmed Points *(01-04)*
  - *01-04A*
  - *01-04B*
- Large Unstemmed Points *(01-05)*
  - *01-05B*
- Small Expanding Stemmed/Corner-Notched Points *(01-06)*
  - *01-06E*

DRILLS (02-00)

- Shaped Base Drills *(02-01)*
  - *02-01A*
  - *02-01B*
- Drill Fragments and Segments *(02-03)*
  - *02-03A*

WEDGES (03-00)

- *03-01A*

SCRAPERS (05-00)

- Flake/Unifacial Scrapers *(05-02)*
  - *05-02A*

BIFACES (10-00)

- Cobble/Quarried Block Biface I *(10-01)*
  - *10-01A*
- Cobble/Block Biface II/Thick Biface *(10-02)*
  - *10-02A*
- Thin Biface I *(10-03)*
  - *10-03A*
- Thin Biface IIa *(10-04)*
  - *10-04A*
- Thin Biface IIb *(10-05)*
  - *10-05A*

Table 36. Continued

MISCELLANEOUS BIFACE IMPLEMENTS (11-00)
- Thick Biface Tool *(11-02)*
  - *11-02A*

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)
  - *12-01A*

MODIFIED FLAKES (13-00)
  - *13-01B*

CORES (14-00)
  - *14-01A*

SPLIT/TESTED COBBLES (15-00)
- Split Cobbles *(15-01)*
  - *15-01A*
- Tested Cobbles *(15-02)*
  - *15-02A*

DEBITAGE (16-00)
  - *16-01A*

Fired Clay *(02)*

CERAMICS (01-00)
- Plain Grog, Grit, and Bone Tempered Wares *(01-01)*
  - *01-01A*
- Decorated/Slipped Grog, Grit, and Bone Tempered Wares *(01-02)*
  - *01-02D*
- Plain Shell Tempered Wares *(01-03)*
  - *01-03A*

BAKED CLAY (03-00)
  - *03-01A*

Ground Stone *(03)*

MANOS (01-00)
- Unifacial Manos *(01-01)*
  - *01-01A*
- Bifacial Manos *(01-02)*
  - *01-02A*
- Pitted Manos *(01-04)*
  - *01-04A*

METATES/GRINDING SLABS (02-00)
- Slab *(02-01)*
  - *02-01A*

MISCELLANEOUS GROUND STONE IMPLEMENTS (06-00)
- Ground Stone Fragments *(06-03)*
  - *06-03A*
  - *06-03B*

Table 36. Continued

Pecked/Battered/Unmodified Cobbles *(04)*

PITTED STONES (02-00)
Unifacial *(02-01)*
02-01A

MISCELLANEOUS PECKED/BATTERED STONE (03-00)
03-01A

UNMODIFIED COBBLES/PEBBLES (04-00)
Unmodified Nodules - Special Context *(04-04)*
04-04A

Faunal *(08)*

BONE/HORN/TEETH (01-00)
01-01A

Floral *(09)*

convex and the third has straight edges. Cross sections are biconvex. Maximum width is at the shoulders. One item has a barbed shoulder. Broad corner notches are present, and extensive stem preparation results in expanding stems. Bases are straight and basal corners are acute (2) or rounded (1). Distal tips are acute. All exhibit reworked shoulders and one specimen has an extensively reworked blade.

Comments: These artifacts resemble the *Lange* point.

References: Bell 1958: 36, Pl. 18; Suhm and Jelks 1962: 203, Pl. 102.

01-01-02B N=1: 1 Fragmentary (Fig. 31 f)

This reworked specimen is biconvex in cross section. Maximum width occurs at the shoulders which tend to be weak. The expanding stem is the result of shallow corner notches. The base is straight and has rounded corners. One blade edge is convex. The opposite blade edge is broken and slightly concave. Tiny flake scars are observed unifacially along the concave edge and are believed to represent wear. The distal end has been reworked so that it is rounded.

Comments: This item is similar to the *Ensor* points.

References: Bell 1960: 32, Pl. 16; Suhm and Jelks 1962: 189, Pl. 95.

01-01-02C N=1: 1 Complete (Fig. 31 g)

This specimen has a triangular blade with straight edges and an acute distal end. Maximum width occurs at the shoulders. One shoulder is slightly barbed and the other has been reworked. Deep, relatively broad corner notches produce an expanding stem. The base is slightly concave and the basal corners are acute. This artifact is plano-convex in cross section. One side exhibits flake scars only along the edges so that the original flake ventral surface remains.

Comments: This specimen resembles points of the *Edgewood* type.

References: Bell 1958: 20, Pl. 10; Suhm and Jelks 1962: 183, Pl. 92.

01-01-02J N=1: 1 Fragmentary (Fig. 31 h)

This biconvex specimen has a slightly expanding stem due to deep corner notches. The base is straight and maximum width occurs at the shoulders. The blade outline could not be determined. Both shoulders are reworked.

Comments: This artifact resembles points of the *Yarbrough* type.

References: Bell 1960: 98, Pl. 49; Suhm and Jelks 1962: 261, Pl. 131.

01-01-02N N=3: 3 Fragmentary (Fig. 31 i)

These specimens have triangular blades with straight edges and are biconvex in cross section. Maximum width is at the shoulders which are pronounced and barbed. The distinctly expanding stems are slightly bulbous and are the result of deep corner notches. Bases are convex and the basal corners are rounded. All have been reworked either at the shoulders or distal end.

Comments: These artifacts are similar to *Williams* points.

References: Bell 1960: 96, Pl. 48; Suhm and Jelks 1962: 259, Pl. 130.

01-01-02Q N=1: 1 Fragmentary (Fig. 31 j)

This biconvex artifact has a triangular blade with straight edges. Maximum width is at the shoulders which are pronounced. Deep corner notches produce an expanding stem. The base is slightly concave and the corners are rounded. One shoulder exhibits reworking.

01-01-02R N=1: 1 Fragmentary (Fig. 31 k)

This biconvex specimen has a long triangular blade with slightly serrated straight edges. Maximum width is at the shoulders. Broad, deep corner notches produce an expanding stem with rounded basal corners. The base is concave.

01-01-02V N=1: 1 Fragmentary

This biconvex artifact displays a triangular blade with one concave and one convex edge. Maximum width is at the shoulders which are pronounced. Broad, deep corner notches result in an expanding stem. Basal characteristics could not be determined due to breakage. One shoulder has been reworked.

Large Straight Stemmed Points *(01-01-04)*

01-01-04A N=3: 3 Fragmentary (Fig. 31 l)

The items in this category display triangular blades and are characterized by straight stems. Maximum width occurs at the shoulders. Two specimens have biconvex cross sections and one is plano-convex. Blade edges are convex (2) and slightly concave (1). Bases are straight and basal corners are acute. All have rounded distal ends probably due to reworking.

Comments: These specimens are similar to the *Carrollton* point.

References: Bell 1958: 12, Pl. 6; Suhm and Jelks 1962: 171, Pl. 86.

01-01-04B N=1: 1 Fragmentary (Fig. 31 m)

This specimen has a triangular blade with slightly convex edges and is biconvex in cross section. Maximum width is at the shoulders which are weakly defined. The straight stem is short and broad and the single basal corner is rounded. The base outline could not be determined. An impact fracture occurs at the distal end.

Comments: This item resembles the *Morhiss* point type.

References: Bell 1958: 58, Pl. 29; Suhm and Jelks 1962: 221, Pl. 111.

Large Unstemmed Points *(01-01-05)*

01-01-05B N=1: 1 Complete (Fig. 31 n)

This biconvex specimen exhibits a triangular outline with straight to slightly convex lateral edges. Maximum width is at the base which is deeply concave and ground smooth. The lateral edges are also ground near the base. The distal tip is rounded due to reworking.

Comments: This artifact resembles the *Meserve* and the *Plainview* point types.

References: Bell 1958: 52 and 74, Pl. 26 and 37; Suhm and Jelks 1962: 217 and 239, Pl. 109 and 120.

Small Expanding Stemmed/Corner-Notched Points *(01-01-06)*

01-01-06E N=1: 1 Fragmentary (Fig. 31 p)

This specimen has a triangular blade with straight edges and is biconvex in cross section. Maximum width occurs at the broken but distinct shoulders. The expanding stem results from corner-notching. The base is straight and the basal corners are acute.

DRILLS (02-00)

Shaped Base Drills *(01-02-01)*

01-02-01A N=1: 1 Fragmentary

This specimen has a long narrow blade element with straight edges. Crushing occurs bifacially along the lateral edges and may represent wear.

This artifact is rhomboid in cross section. The broken haft element is suggestive of a contracting stem.

01-02-01B N=1: 1 Fragmentary

This artifact is characterized by a bulbous base and a slightly contracting blade element. It appears beveled in cross section due to reworking of alternate edges. Crushing occurs bifacially along the lateral edges.

Drill Fragments and Segments *(01-02-03)*

01-02-03A N=1: 1 Fragmentary

This specimen is a narrow distal end exhibiting an acute tip and slightly contracting edges. Edge rounding occurs on the lateral edges. This artifact appears slightly beveled due to reworking of alternate edges.

WEDGES (03-00)

01-03-01A N=2: 2 Complete (Fig. 31 q)

These bifacially flaked items are biconvex in cross section. Wear damage in the form of tiny flake scars is bifacially observed along a straight distal edge. Crushing and tiny flake scars are observed proximally and are believed to represent damage from a percussor.

SCRAPERS (05-00)

Flake/Unifacial Scrapers *(01-05-02)*

01-05-02A N=2: 2 Fragmentary

These unshaped items exhibit unifacial edge alteration in the form of tiny flake scars and edge rounding. Two opposite edges of one specimen have been deliberately modified to the extent that they appear beveled. Wear is extensive along these convex edges. The other specimen exhibits minimal edge alteration along the convex portions of one edge.

BIFACES (10-00)

Cobble/Quarried Block Biface I *(01-10-01)*

01-10-01A N=10: 10 Complete (Fig. 32 a)

These artifacts reflect the shape of the original parent specimen

and exhibit large flake scars and sinuous edges. Cross sections are thick and irregular. Stream cortex is observed bifacially and covers at least 50% of one surface. Step and hinge fractures are numerous.

Cobble/Block Biface II/Thick Biface *(01-10-02)*

01-10-02A N=102: 52 Complete, 50 Fragmentary

These items have been minimally modified so that they display large flake scars and thick, irregular cross sections. Remnants of cortex are observed on 57% of the artifacts. Platform preparation is noted on several specimens. Seventy-five percent of the complete specimens exhibit step and hinge fractures and 82% of the broken items have hinge and step fractures.

Thin Biface I *(01-10-03)*

01-10-03A N=30: 18 Complete, 12 Fragmentary (Fig. 32 c)

These specimens are slightly irregularly thinned and cross sections vary from biconvex (70%) to plano-convex (30%). Cortex occurs on 30% of these specimens. Shapes include subrectangular, triangular, and ovoid. Edges are slightly sinuous (53%) or regular (47%). Platform preparation is infrequently observed. Twenty-three percent of the sample appears to be made from flakes. Hinge and step fractures have been observed on complete (89%) and fragmentary (58%) specimens.

Thin Biface IIa *(01-10-04)*

01-10-04A N=15: 1 Complete, 14 Fragmentary (Fig. 32 d)

These items exhibit small flake scars, no cortex and are uniformly thinned. Cross sections are plano-convex (27%) and biconvex (73%). Edges are regular and range from straight to slightly convex. These deliberately shaped specimens are triangular (47%), subrectangular (40%), and ovate (13%) in outline. Fifty-three percent exhibit hinge and step fractures. Two of the fragments appear thermally altered.

Thin Biface IIb *(01-10-05)*

01-10-05A N=11: 5 Complete, 6 Fragmentary (Fig. 32 e-f)

These items are similar to category *01-10-04A* but have some indication of a haft element. Four exhibit irregularly contracting proximal ends while seven have been notched. All display at least one weakly defined shoulder. Items in this category exhibit numerous hinge and step fractures.

Table 37. Metric attributes for selected chipped stone varieties from 34Pu-73.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-01A					
$\bar{x}$	42.1	26.7	7.5	14.3	15.5
s.d.	6.7	4.9	0.6	3.8	4.0
range	34.5-58.9	21.8-37.8	6.6-8.6	8.9-20.7	10.5-23.2
N	10	12	14	16	16
01-01-02A					
$\bar{x}$	50.8	32.0	12.8	16.9	16.0
s.d.	2.4	2.6	0.6	1.6	-
range	48.4-53.2	29.4-34.6	12.2-13.3	15.3-18.4	-
N	3	3	3	2	1
01-01-02B					
$\bar{x}$	38.0	-	7.5	11.8	20.8
N	1	-	1	1	1
01-01-02C					
$\bar{x}$	38.3	23.0	5.2	17.0	18.6
N	1	1	1	1	1
01-01-02J					
$\bar{x}$	-	-	5.8	9.7	-
N	-	-	1	1	-
01-01-02N					
$\bar{x}$	36.0	28.7	6.8	9.4	19.6
s.d.	7.0	0.4	0.2	1.5	2.5
range	29.0-43.0	28.3-29.0	6.6-7.0	8.0-11.9	17.1-23.4
N	2	2	3	4	4
01-01-02R					
$\bar{x}$	-	27.5	8.1	7.2	19.3
N	-	1	1	1	1
01-01-02V					
$\bar{x}$	-	31.1	9.4	-	20.3
N	-	1	1	-	1

Table 37. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-04A					
$\bar{x}$	48.3	21.7	7.8	16.7	15.0
s.d.	-	-	0.6	0.3	1.9
range	-	-	7.2-8.6	16.4-17.0	13.1-16.8
N	1	1	3	2	2
01-01-05B					
$\bar{x}$	58.3	27.9	7.8	25.1	27.9
N	1	1	1	1	1
01-01-06E					
$\bar{x}$	-	10.4	3.3	7.2	10.4
N	-	1	1	1	1
01-10-01A					
$\bar{x}$	63.9	44.7	27.1	-	-
s.d.	11.0	61.0	6.3	-	-
range	45.1-86.4	36.7-65.5	16.9-38.8	-	-
N	10	10	10	-	-
01-10-02A					
$\bar{x}$	55.6	39.8	21.8	-	-
s.d.	12.9	8.1	7.6	-	-
range	36.2-105.5	26.6-63.6	9.9-50.8	-	-
N	52	52	52	-	-
01-10-03A					
$\bar{x}$	49.3	32.7	12.0	-	-
s.d.	12.0	6.6	3.5	-	-
range	32.7-75.8	22.8-43.5	5.0-20.3	-	-
N	17	18	18	-	-
01-10-04A					
$\bar{x}$	42.2	26.7	16.7	-	-
N	1	1	1	-	-

Table 37. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-10-05A					
$\bar{x}$	47.3	23.0	9.5	-	-
s.d.	7.2	2.6	2.2	-	-
range	40.2-60.8	20.2-26.9	6.9-13.3	-	-
N	5	5	5	-	-
01-11-02A					
$\bar{x}$	49.9	49.6	25.0	-	-
N	1	1	1	-	-

MISCELLANEOUS BIFACE IMPLEMENTS (11-00)

Thick Biface Tool *(01-11-02)*

01-11-02A N=2: 1 Complete, 1 Fragmentary (Fig. 32 b,g)

These artifacts are characterized by evidence of use in the form of tiny flake scars. The extent of reduction is identical to that observed for category *01-10-02A*. The complete artifact exhibits unifacial alteration along a straight edge. The fragment has unifacial wear along a broken convex edge.

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)

01-12-01A N=177 (Fig. 31 o)

This category is comprised of proximal, distal, and midsections of several biface varieties. Due to their fragmentary condition, they could not be placed in any of the preceeding varieties. Cross sections vary from biconvex to plano-convex.

Twenty-one are proximal fragments. Two of these represent small point segments and nineteen are believed to be large point sections.

Seventeen are distal fragments exhibiting acute ends. Two of these are small point fragments.

The remaining items (137) represent indeterminate edge fragments or midsections. Two are midsections of small points.

MODIFIED FLAKES (13-00)

01-13-01B N=194

These flakes exhibit edge rounding or tiny flake scars which parallel one or more edges. These alterations are suggestive of wear. Type A is the dominant lithic material from both block areas.

CORES (14-00)

01-14-01A N=6: 5 Complete, 1 Fragmentary (Fig. 32 h)

These specimens are characterized by the systematic removal of flakes. Flakes on five specimens are detached from only one direction. The other artifact exhibits flake removal from two opposite directions. Eighty-three percent exhibit remnants of cortex. Platform preparation occurs on 50% of the sample. Hinge and step fractures are observed on all specimens. Ranges for the measurements have been calculated and include: 42.9-80.8 mm (length), 31.1-76.6 mm (width), and 31.0-58.5 mm (thickness).

SPLIT/TESTED COBBLES (15-00)

Split Cobbles *(01-15-01)*

01-15-01A N=6: 6 Complete (Fig. 32 i)

These unshaped artifacts are characterized by minimal flaking, large flake scars, thick irregular cross sections, and more than 50% cortex on one surface. They result from splitting cobbles. Two display step and hinge fractures and length measurements range between 39.9-127.3 mm. They range in width between 30.3-74.6 mm and vary in thickness between 19.4-28.4 mm.

Tested Cobbles *(01-15-02)*

01-15-02A N=23: 23 Complete

These cobbles have been minimally flaked so that considerable cortex remains. The flake scars are large and generally restricted to one area. Edges are sinuous and there is no attempt at shaping. Hinge and step fractures are present on 83% of the sample. Dimension ranges have been recorded and include: 26.9-93.5 mm (length), 18.7-82.6 mm (width), and 12.5-75.0 mm (thickness).

DEBITAGE (16-00)

01-16-01A N=46,217

The 24 dry screen excavation units in Block A yielded 22,835 pieces of debitage. A total of 18,562 flakes and blocky debris was collected from the 14 dry screened squares in Block B. For both areas, debitage was most abundant in the upper 20 cm of the deposit. Of this total 4,820 flakes were recovered from the waterscreen sample.

Fired Clay *(02)*

CERAMICS (01-00)

Plain Grog, Grit, and Bone Tempered Wares *(02-01-01)*

02-01-01A N=9: 9 Body sherds

Definition: A grog tempered plainware with occasional grit or bone inclusions. Vessel walls are thick and the texture is coarse.

Method of Manufacture: Coiling. Breaks along coil welds occur on five sherds.

Paste:

Tempering: Grog (crushed sherds) is the primary tempering agent. Grit (3 sherds) and bone (2 sherds) appear as minor inclusions.

Texture: This is coarse and angular primarily due to the large, irregular pieces of grog.

Surface Treatment: Interior and exterior surfaces on the complete sherds are smooth and uneven.

Color:

Exterior: Two are brown-dark brown (10YR 4/3); one is brown (7.5YR 5/4); one is yellowish red (5YR 5/6); one is strong brown (7.5YR 5/6); one is reddish brown (5YR 4/3); and one is red (2.5YR 5/8).

Interior: Three are very dark gray (7.5YR 3/0 or 10YR 3/1); two are brown-dark brown (10YR 4/3); and one is black (7.5YR 2/0).

Core: Five sherds exhibit zoned cores. The exterior core color is different from the respective surface color in three of the zoned sherds. For the two remaining zoned sherds, both the interior and exterior core colors are different from the surface colors. Observed zoned core colors include: black (7.5YR 2/0); strong brown (7.5YR 5/6-5/8); reddish brown (5YR 5/3); very dark gray (10YR 3/1); light brown (7.5YR 6/4); and reddish yellow (7.5YR 6/6). Core color for the four unzoned sherds is black (5YR 2.5/1 or 7.5YR 2/0).

Thickness: Range = 6.1-10.6 mm; $\bar{x}$ = 7.9 mm (N=7).

Comments: The two sherds with bone inclusions possibly represent the same vessel due to their identical provenience, paste characteristics, and color.

These sherds are similar to *Williams Plain* (Orr 1946: 235; Bell and Dale 1953: 120-123; Brown 1971: 42-55). This type is believed to represent an early plainware (Wyckoff 1970a: 98; Galm 1978b: 51). This ceramic type is also considered a utilitarian ware during the early Caddoan period (Brown 1971: 47-48; Bell 1972: 252).

Decorated/Slipped Grog, Grit, and Bone Tempered Wares *(02-01-02)*

02-01-02D N=1: 1 Body sherd

Definition: A grog tempered ware with traces of an exterior surface slip.

Method of Manufacture: Coiling. Coil breaks are observed.

Paste:

Tempering: Grog (crushed sherds) is the primary tempering material. Occasional bone inclusions are noted.

Texture: The texture is coarse and angular.

Surface Treatment: The interior surface is smooth and uneven. The weathered exterior surface exhibits remnants of what is believed to be a slip.

Color:

Exterior: Yellowish red (5YR 5/8).

Interior: Yellowish red (5YR 4/6).

Core: Very dark gray (7.5YR 3/0).

Thickness: Range = 7.0 mm; $\bar{x}$ = 7.0 mm.

Comments: This sherd has not been related to previously established ceramic types due to the questionable identification of a slip on the badly weathered exterior surface.

Plain Shell Tempered Wares *(02-01-03)*

02-01-03A N=1: 1 Body sherd

Definition: A shell tempered undecorated ceramic with a coarse paste.

Method of Manufacture: Coiling. This sherd is broken along the coil weld.

Paste:

Tempering: The tempering material is crushed shell which is leached.

Texture: The texture is coarse.

Surface Treatment: The surfaces are smooth and uneven.

Color:

Exterior: Brown (7.5YR 5/4).

Interior: Brown (7.5YR 5/4).

Core: The core is zoned and the exterior core color is the same as the respective surface color. The interior core color is very dark gray (5YR 3/1).

Thickness: Range = 5.5 mm; $\bar{x}$ = 5.5 mm.

Comments: This sherd resembles *Woodward Plain* (Hall 1951; Freeman and Buck 1960; Brown 1971: 141-146). This type of pottery is one of a variety of shell tempered wares associated with the Caddoan period (Brown 1971: 220). Shell tempered wares are believed to be more prevalent during later Caddoan times (Brown 1971: 219-223). However, shell tempered wares are infrequently present in early Caddoan assemblages (Brown 1971; Bell 1972; Rohrbaugh 1973; 7, 79).

BAKED CLAY (03-00)

02-03-01A

Tiny fragments of baked clay totaling 23.1 g were recovered. These nodules were scattered throughout the fill of Feature 78-2 (18.5 g) and Feature 78-6 (4.6 g).

Ground Stone *(03)*

MANOS (01-00)

Unifacial Manos *(03-01-01)*

03-01-01A N=7: 2 Complete, 5 Fragmentary

These sandstone specimens are characterized by one flat surface that is ground smooth on which tiny pecked areas occur infrequently. The opposite surface also exhibits occasional pecking marks. Four items have pecked margins suggestive of deliberate shaping. The complete specimens are elongated oval in outline.

Bifacial Manos *(03-01-02)*

03-01-02A N=2: 1 Complete, 1 Fragmentary (Fig. 33 c)

These artifacts are bifacially ground. Both surfaces are flat and exhibit occasional pecking marks. Pecking along the margins indicate that the sandstone specimens have been deliberately shaped. The complete artifact is oval in shape.

Pitted Manos *(03-01-04)*

03-01-04A N=1: 1 Fragmentary

This sandstone specimen exhibits minimal grinding on its convex surface. The opposite surface is irregular and a small, pecked depression is evident. This depression measures 14.5 mm (length) by 16.5 mm (width) by

Table 38. Metric attributes for selected ground and pecked stone varieties from 34Pu-73.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS
03-01-01A			
$\bar{x}$	105.9	100.2	47.1
s.d.	13.7	8.2	14.4
range	90.9-125.1	83.7-110.4	30.3-77.4
N	6	5	7
03-01-02A			
$\bar{x}$	127.3	94.5	31.2
N	1	1	1
03-01-04A			
$\bar{x}$	98.8	62.4	49.1
N	1	1	1
03-02-01A			
$\bar{x}$	349.0	228.4	89.0
N	1	1	1
04-02-01A			
$\bar{x}$	94.6	78.9	46.2
s.d.	10.7	23.4	16.9
range	83.9-105.2	55.5-102.3	29.3-63.1
N	2	2	2
04-03-01A			
$\bar{x}$	98.3	89.3	54.5
s.d.	57.0	59.4	26.2
range	31.7-170.9	24.5-168.0	20.5-84.2
N	3	3	3
04-04-04A			
$\bar{x}$	59.0	50.4	30.0
N	1	1	1

2.0 mm (depth) and the interior is irregular. This object appears to have been minimally shaped.

METATES/GRINDING SLABS (02-00)

Slab *(03-02-01)*

03-02-01A N=1: 1 Complete

This irregular sandstone slab exhibits unifacial grinding on raised areas on one side. Pecking marks are also scattered across this slightly concave surface. This specimen does not appear to be deliberately shaped.

MISCELLANEOUS GROUND STONE IMPLEMENTS (06-00)

Ground Stone Fragments *(03-06-03)*

03-06-03A N=7

These specimens exhibit some evidence of grinding but could not be included within other ground stone varieties. Four are sandstone and three are quartzite. Tiny pecked areas are evident on five of these artifacts. None appear to have been deliberately shaped.

03-06-03B N=2 (Fig. 33 e)

These slate specimens are extensively ground. The tabular shaped fragment is bifacially ground smooth. The other item is a slate flake with a ground dorsal surface.

Pecked/Battered/Unmodified Cobbles *(04)*

PITTED STONES (02-00)

Unifacial *(04-02-01)*

04-02-01A N=3: 3 Fragmentary (Fig. 33 d-e)

These sandstone artifacts are unifacially pecked. On one specimen, infrequent pecking marks are confined to a natural depression. The second item exhibits a shallow, roughly oval pecked depression with an irregular interior surface. Pit dimensions are 27.2 mm (length) by 20.5 mm (width) by 3.7 mm (depth). The last fragment has a relatively deep, oval shaped depression. Within this depression, two small pits are observed which have regular interior surfaces. The depression measures 48.0 mm (length) by 27.1 mm (width) by 10.1 mm (depth). None of these specimens appear to have been deliberately shaped. All may be thermally altered.

Fig. 31. Selected chipped stone artifacts from the Vanderwagen site (34Pu-73).

a-b: *01-01-01A*
c: *01-01-01C*
d-e: *01-01-02A*
f: *01-01-02B*
g: *01-01-02C*
h: *01-01-02J*
i: *01-01-02N*
j: *01-01-02Q*
k: *01-01-02R*
l: *01-01-04A*
m: *01-01-04B*
n: *01-01-05B*
o: *01-12-01A*
p: *01-01-06E*
q: *01-03-01A*

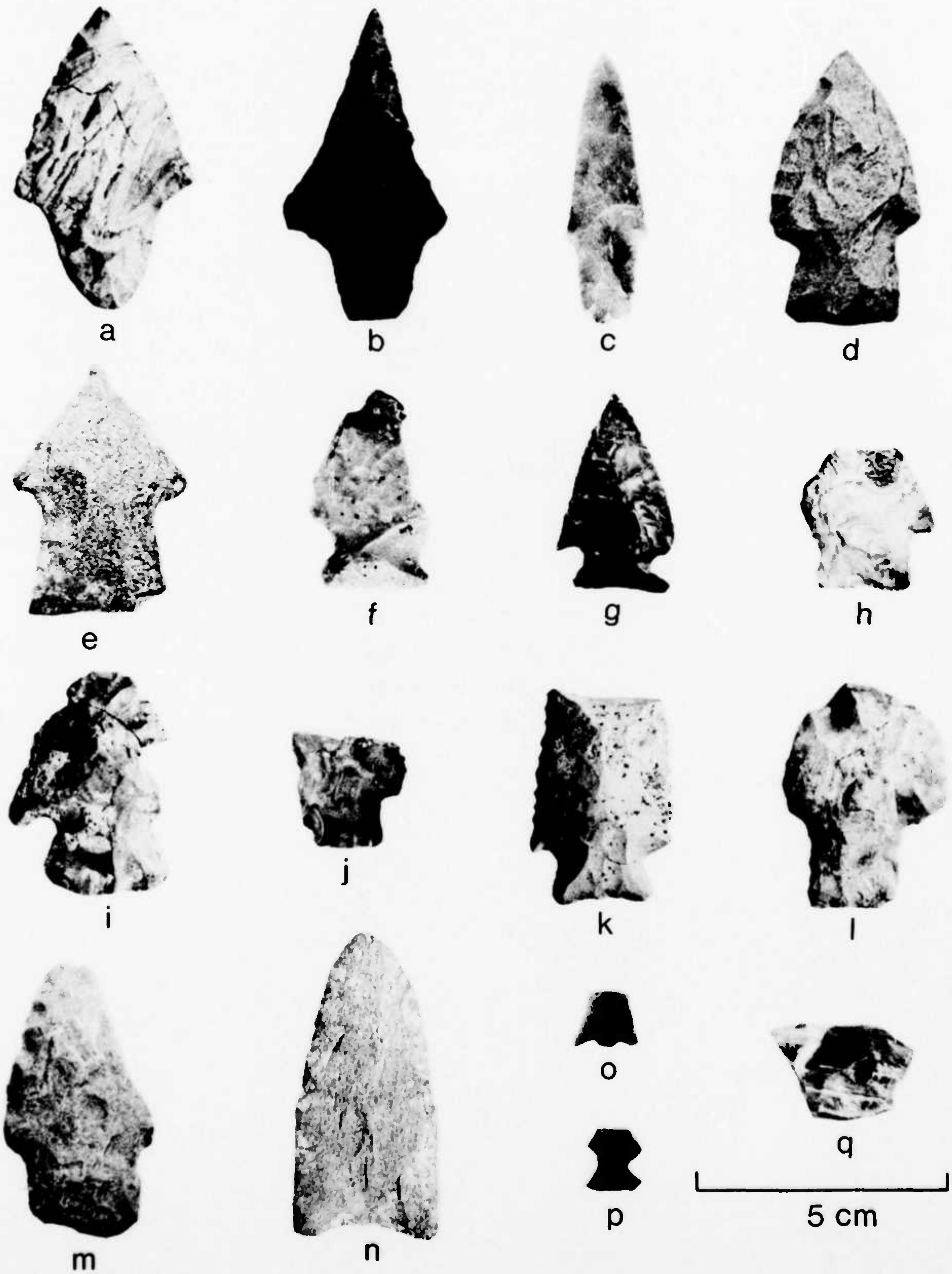

a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
5 cm

Fig. 32. Selected chipped stone artifacts from the Vanderwagen site (34Pu-73).

a: *01-10-01A*
b,g: *01-11-02A*
c: *01-10-03A*
d: *01-10-04A*
e-f: *01-10-05A*
h: *01-14-01A*
i: *01-15-01A*

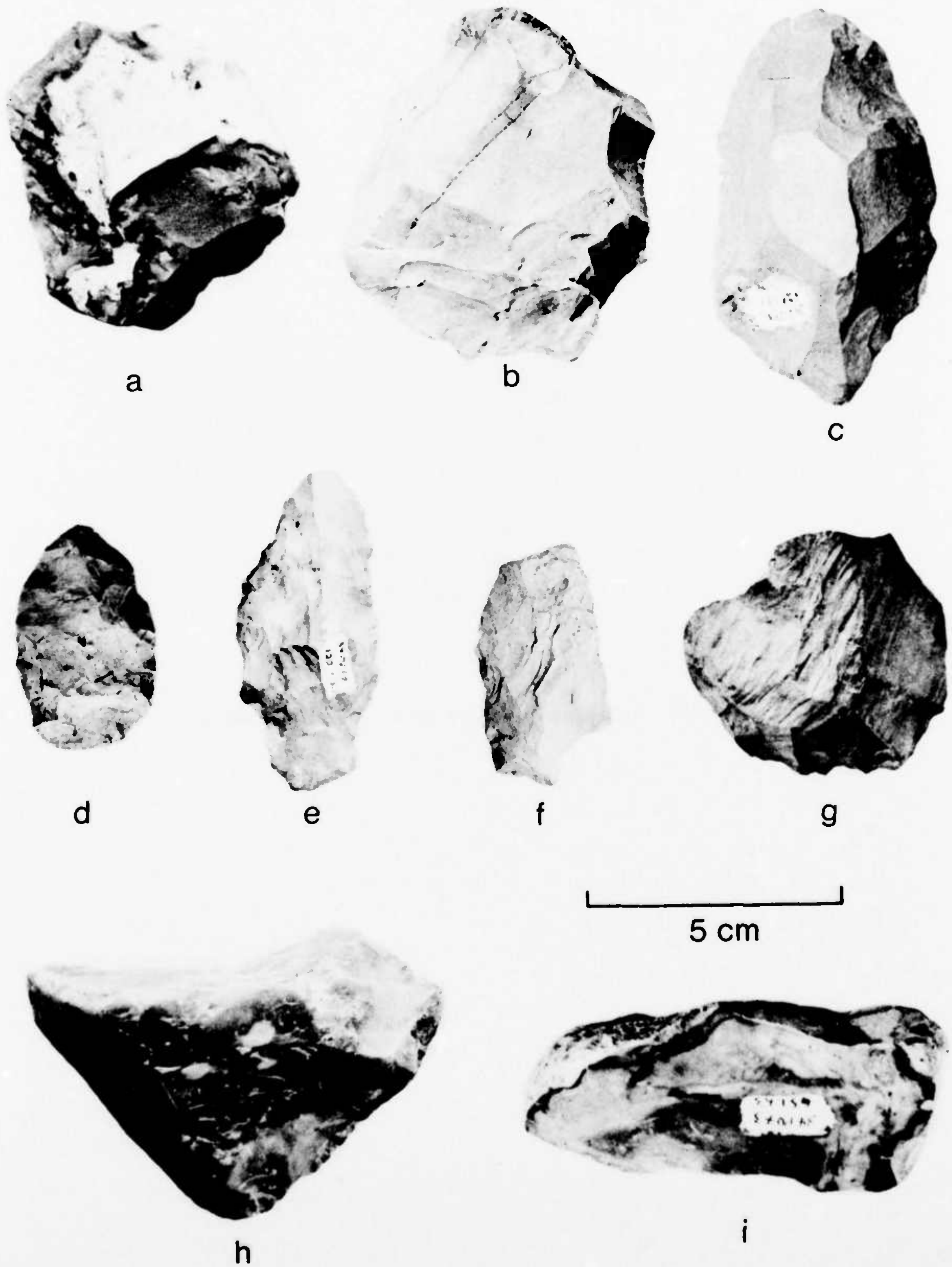
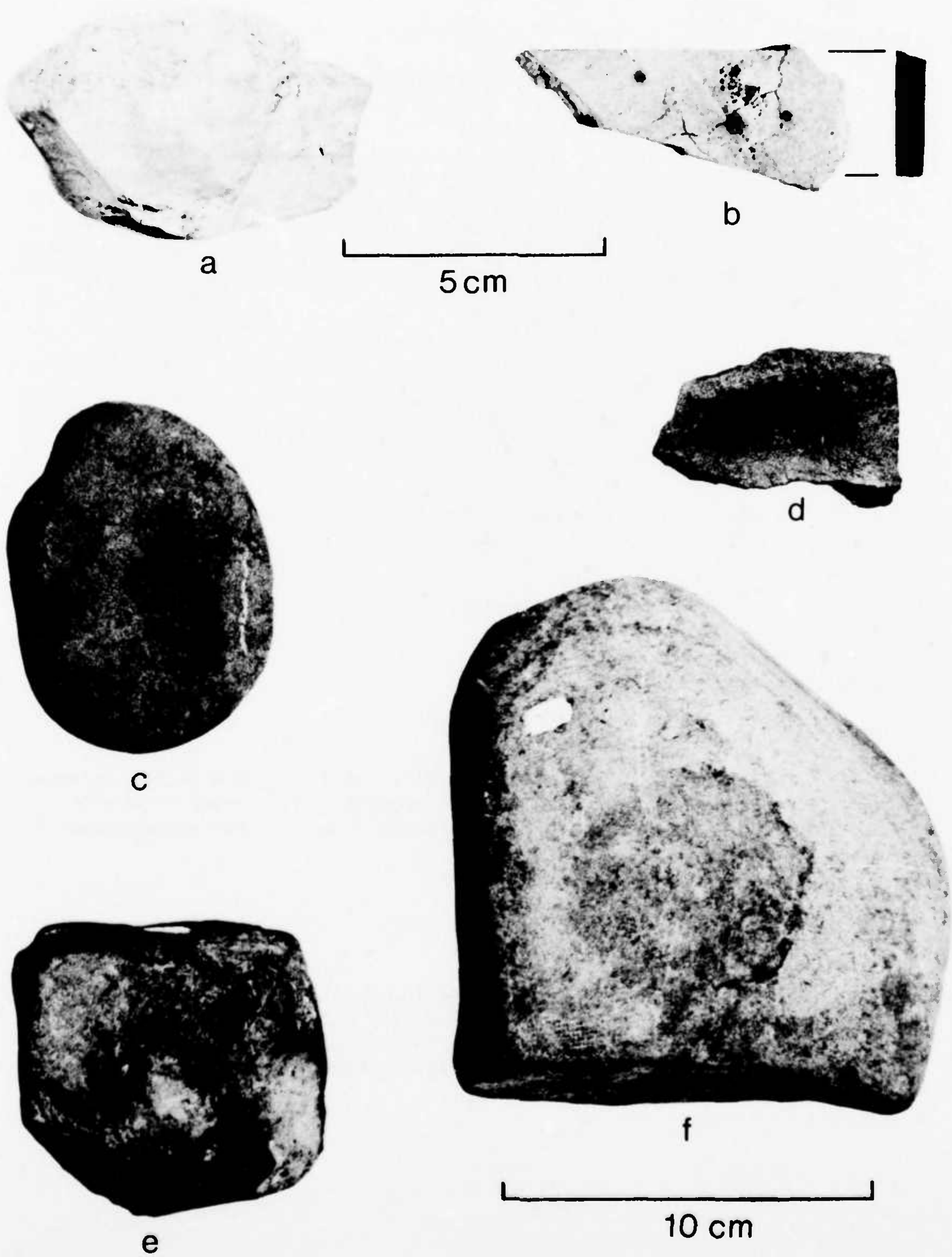

a
b
c
d
e
f
g
5 cm
h
i

Fig. 33. Selected chipped, ground, pecked/battered stone artifacts from the Vanderwagen site (34Pu-73).

a,f: *04-03-01A*
b: *03-06-03B*
c: *03-01-02A*
d-e: *04-02-01A*

Note: Artifacts c-f are shown at 10 cm scale.


a
b
5 cm
c
d
e
f
10 cm

MISCELLANEOUS PECKED/BATTERED STONE (03-00)

04-03-01A N=3: 3 Complete (Fig. 33 a,f)

One of these irregular slabs has minimal pecking marks on a single surface. Pecking is restricted to a circular, slightly concave area which measures 74.1 mm (length) by 72.4 mm (width) by 1.2 mm (depth). This sandstone specimen is minimally shaped due to pecked margins. The second item is made of quartzite and exhibits considerable pecking and battering on a single corner. The opposite surface is flaked. This specimen appears to have been thermally altered based on red colored interior and exterior surfaces. The third specimen is a small irregular nodule which exhibits battering along its corners and margins. This item is made of quartz.

UNMODIFIED COBBLES/PEBBLES (04-00)

Unmodified Nodules - Special Context *(04-04-04)*

04-04-04A N=1: 1 Complete

This irregular cobble was culturally derived and is associated with Feature 78-2.

Faunal *(08)*

BONE/HORN/TEETH (01-00)

08-01-01A N=2

Faunal remains (.9 g) could not be identified. One burned fragment (.8 g) represents a deer-size mammal fragment and is associated with Feature 78-6. The unburned fragment comes from the waterscreened matrix around Feature 78-3.

Floral *(09)*

Charcoal (32.5 g), burned nutshell (.7 g), and unburned seeds (.6 g) were recovered from 34Pu-73. The seeds and nutshell fragments were recovered from the waterscreen samples (A10-24 and B28-19). The charcoal occurred as small flecks was scattered throughout the fill of Feature 78-2 and 78-6.

DISCUSSION AND INTERPRETATIONS

Artifacts recovered from the Vanderwagen site are presented according to block areas in Tables39 and 40. Based on these figures, the distinctive nature of the features, and the possibility that an erosional gully divided the two loci in the past, it is believed that separate discussions of Blocks A and B are warranted.

Block A

Lithic materials dominate the cultural remains from this area. Excluding debitage, chipped stone constitutes 95% of the artifact sample. Ground and pecked stone (3%) and ceramics (2%) comprise only a small proportion of the Block A artifacts.

Points comprise 7% of the chipped stone artifacts. Large contracting stemmed points *(01-01-01A)* and large expanding stemmed/corner-notched varieties *(01-01-02)* are the dominant point categories.

Impact fractures are rarely observed although a majority (79%) of the points are broken. Seventy-five percent of the large points exhibit evidence of reworking, generally along the lateral margins or distal ends. All of the large expanding stemmed/corner-notched varieties *(01-01-02)* and 67% of the large contracting stemmed points *(01-01-01A)* are characterized by some evidence of reworking or resharpening.

The dominance of broken and reworked points suggests on-site utilization and maintenance of these implements. High frequencies of broken and reworked points have been reported for sites located in the Wister Valley (Galm and Flynn 1978: 137). It is believed that many of these reworked Wister Valley points were used for a variety of processing activities such as scraping and cutting rather than as hunting projectiles. The Block A data may also reflect this trend.

Artifacts suggestive of testing/procurement *(01-10-01A, 01-14-01A, 01-15-01A,* and *01-15-02A),* initial modification *(01-10-02A),* and secondary shaping and thinning *(01-10-03A, 01-10-04A,* and *01-10-05A)* have been recovered. These chipped stone artifacts indicate that all stages of the reduction continuum (Bobalik 1977: 32-41) are represented and that lithic manufacturing was a major activity at Block A. In addition, three reduction strategies are represented. These strategies include bifacial modification of cobbles, splitting of cobbles for bifacial reduction, and production of flakes from a core.

Material type frequencies for chipped stone artifacts and debitage are provided in Tables 41, 42, and 43. Debitage material type percentages are presented in two squares (A54-15 and A60-6). These data indicate the use of locally available materials throughout the occupation of this locus. Type A is dominant and constitutes 54% of the artifacts and 83% of the

Table 39. Vertical and horizontal distribution of cultural remains from Block A at 34Pu-73.

Artifact Variety	Arbitrary Levels (10 cm) - On-Mound						Arbitrary Levels (10 cm) - Off-Mound						Surface	Total
	1	2	3	4	5	Sub-Total	1	2	3	4	5	Sub-Total		
01-01-01A	2	4	1			7		1				1	1	9
01-01-02A	1	1				2								2
01-01-02J	1					1								1
01-01-02N	1			1		2								2
01-01-02Q							1					1		1
01-01-02V										1		1		1
01-01-04A		1				1								1
01-01-04B									1			1		1
01-01-05B									1			1		1
01-01-06E										1		1		1
01-02-03A	1					1								1
01-03-01A	1	1				2								2
01-05-02A		1				1							1	2
01-10-01A	2	1				3	1			1		2		5
01-10-02A	16	13	9	3		41	5	2	2	1		10	1	52
01-10-03A	4	2	4	1		11	1	2				3		14
01-10-04A		2		2		4	3			1		4	1	9
01-10-05A	1	2	[illegible]		1	5	1	1				2		7
01-11-02A								1				1		1
01-12-01A	49	20	12	3		84	13	9	2			24		108
01-13-01B	46	25	8	6		85	6	9	3			18	1	104
01-14-01A		1	1			2							2	4
01-15-01A	1	2				3		1				1		4
01-15-02A	11	1	2	2		16			1		1	2	1	19
02-01-01A	4	1	1			6								6
02-01-020	1					1								1
03-01-01A		1	2			3								3
03-01-02A		1				1								1
03-06-03A		3	1	1		5								5
03-06-03B			1			1								1
04-02-01A			1			1								1
04-03-01A			1			1			1			1		2
04-04-04A			1			1								1
08-01-01A		1				1								1
Total	142	84	46	19	1	292	31	26	11	5	1	74	8	374
01-16-01A	8231	4988	2834	1151	79	17,283	2691	1683	855	299	17	5545	7	22,835

Table 40. Vertical and horizontal distribution of cultural remains from Block B at 34Pu-73.

Artifact Variety	Arbitrary Levels (10 cm) - On-Mound									Arbitrary Levels (10 cm) - Off-Mound										
	1	2	3	4	5	6	7	Code 4	Sub-Total	1	2	3	4	5	6	7	Code 4	Sub-Total	Surface	Total
01-01-01A	1	2		2	1				6	2	1							3		9
01-01-01C												1						1		1
01-01-02A			1						1											1
01-01-02B					1				1											1
01-01-02C	1								1											1
01-01-02N					1				1											1
01-01-02R					1				1											1
01-01-04A					1				1		1							1		2
01-02-01A		1							1											1
01-02-01B											1							1		1
01-10-01A		1	2	1					4		1							1		5
01-10-02A	8	3	1	8	3	4		1	28	6	5	5	1	2				19	3	50
01-10-03A	2	4	4	1	2				13	1	1		1					3		16
01-10-04A	1	3	1		1				6											6
01-10-05A	2				1				3		1							1		4
01-11-02A										1								1		1
01-12-01A	13	12	4	10	4		1		44	14	7	2	1	1				25		68
01-13-01B	10	12	10	14	11	2			59	15	9	5	1	1				31		90
01-14-01A			1	1					2											2
01-15-01A				1	1				2											2
01-15-02A	1			2					3	1								1		4
02-01-01A	3								3											3
02-01-03A				1					1											1
03-01-01A		1						2	3		1							1		4
03-01-02A		1							1											1
03-01-04A											1							1		1
03-02-01A					1				1											1
03-06-03A	1				1				2											2
03-06-03B										1								1		1
04-02-01A						1		1	2											2
04-03-01A		1							1											1
Total	43	41	24	41	30	7	1	4	191	41	29	13	4	4				91	3	285
01-16-01A	3369	3319	2028	1562	879	353	19		11,529	3601	2143	741	323	187	35		2	7030	1	18,562

Table 41. Lithic material type frequencies for selected chipped stone varieties from 34Pu-73.

Block/Artifact Variety		Material Types											
		A	B	C	D	E	F	G	H	I	J	K	Total
A	01-01-01A	4	3						1		1		9
	01-01-02A	1							1				2
	01-01-02J	1											1
	01-01-02N		1					1					2
	01-01-02Q										1		1
	01-01-02V	1											1
	01-01-04A	1											1
	01-01-04B	1											1
	01-01-05B								1				1
	01-01-06E	1											1
	01-02-03A								1				1
	01-03-01A	1									1		2
	01-05-02A	1									1		2
	01-10-01A	3					1		1				5
	01-10-02A	26			3		4		6		13		52
	01-10-03A	10			1				1		2		14
	01-10-04A	5			2				1		1		9
	01-10-05A	2	2			1			1		1		7
	01-11-02A						1						1
	01-12-01A	62	10	2	5	2	3		8		11	5	108
	01-13-01B	57	24			2	1		3		17		104
	01-14-01A	3							1				4
	01-15-01A	1						1			2		4
	01-15-02A	9	1			1	1	1			6		19
Total		190	41	2	11	6	11	3	26		57	5	352
%		54	12	1	3	2	3	1	7		16	1	
B	01-01-01A	5	2						2				9
	01-01-01C	1											1
	01-01-02A								1				1
	01-01-02B	1											1
	01-01-02C	1											1
	01-01-02N										1		1
	01-01-02R										1		1
	01-01-04A	2											2
	01-02-01A										1		1
	01-02-01B			1									1
	01-10-01A	3					1				1		5
	01-10-02A	36	5		2		1		1		5		50
	01-10-03A	5	2		1		1		4		3		16
	01-10-04A	4							1		1		6
	01-10-05A		1		1			1	1				4
	01-11-02A	1											1
	01-12-01A	38	8		4		1		2		14	2	69
	01-13-01B	47	28		2	1	2	1	1		7	1	90
	01-14-01A	2											2
	01-15-01A	1									1		2
	01-15-02A	4											4
Total		151	46	1	10	1	6	2	13	-	35	3	268
%		56	17	.5	4	.5	2	1	5		13	1	

Table 42. Vertical distribution of material type frequencies for selected chipped stone artifacts from Blocks A and B at 34Pu-73.

Provenience (Block:Level) (10 cm)	A	B	C	D	E	F	G	H	I	J	K	Total	%
Block A													
Surface	4	2	-	1	-	-	-	-	-	-	-	7	1
1	93	19	1	4	3	6	-	10	-	30	4	170	49
2	51	11	1	3	3	3	2	9	-	15	1	99	29
3	32	7	-	2	-	1	-	4	-	4	-	50	14
4	10	2	-	1	-	1	1	3	-	6	-	24	6
5	-	-	-	-	-	-	-	-	-	2	-	2	1
Sub-total	190	41	2	11	6	11	3	26	-	57	5	352	
%	54	12	1	3	2	3	1	7	-	16	1		100
Block B													
Surface	2	-	-	-	-	-	-	-	-	1	-	3	1
1	42	14	-	3	-	1	-	3	-	15	1	79	30
2	37	13	1	4	-	2	1	1	-	7	-	65	24
3	17	9	-	-	1	1	-	3	-	6	-	37	14
4	27	7	-	3	-	-	-	4	-	2	1	44	17
5	19	3	-	-	-	2	1	1	-	5	1	32	11
6	6	-	-	-	-	-	-	-	-	-	-	6	2
7	1	-	-	-	-	-	-	-	-	-	-	1	<1
Code 4	-	-	-	-	-	-	-	1	-	-	-	1	<1
Sub-total	151	46	1	10	1	6	2	13	-	35	3	268	
%	56	18	<1	4	<1	2	1	4	-	14	1		100
Total	341	87	3	21	7	17	5	39	-	92	8	620	
%	55	14	1	3	1	3	1	6	-	15	1		100

Table 43. Debitage material type frequencies for selected squares from Blocks A and 8 at 34Pu-73.

Provenience (Square:Level) (10 cm)	A	B	C	D	E	F	G	H	I	J	K	Total	%
Block A													
54-15:													
1	360	12	-	-	1	1	-	24	-	9	-	406	33
2	295	20	-	-	-	-	-	19	-	4	-	338	28
3	210	13	-	-	-	-	-	20	-	7	-	250	20
4	131	4	-	-	3	-	-	8	-	3	-	149	12
5	70	-	-	-	1	1	-	4	-	-	-	76	6
Sub-total	1066	49	-	-	5	2	-	75	-	23	-	1220	
%	87	4	-	-	.5	.2	-	6	-	2	-		100
60-6:													
1	425	18	-	10	5	1	-	42	-	20	-	521	46
2	235	17	-	1	-	1	-	24	-	17	-	295	26
3	158	5	2	1	-	1	-	13	-	8	-	188	16
4	74	11	1	2	2	3	-	8	-	19	-	120	10
5 W½	11	1	-	-	-	2	-	1	-	1	-	16	2
Sub-total	903	52	3	14	7	8	-	88	-	65	-	1140	
%	79	4	.3	1	.5	.7	-	8	-	6	-		100
Block B													
26-13:													
1	754	130	3	16	9	2	17	78	-	74	1	1084	36
2	654	132	3	27	7	7	9	42	-	45	2	934	31
3	296	82	2	-	6	-	42	40	-	17	-	485	16
4	250	59	-	4	10	3	7	35	-	34	-	402	13
5	83	5	-	-	1	1	-	8	-	12	-	110	4
Sub-total	2042	408	8	47	33	13	75	204	-	182	3	3015	
%	68	14	.3	1	1	.4	2	7	-	6	>.1		100
27-12:													
1	472	155	6	13	21	2	10	72	-	169	-	920	32
2	625	112	1	5	7	5	36	53	-	23	3	870	30
3	248	36	2	8	7	2	-	17	-	50	2	372	13
4	305	19	6	9	2	2	-	10	-	20	1	374	13
5	116	19	1	-	-	-	15	12	-	10	1	174	6
6 N½	45	20	0	0	0	1	5	7	-	11	-	89	3
6E½	53	20	-	2	2	3	1	3	-	18	-	102	3
Sub-total	1864	381	16	37	39	15	67	174	-	301	7	2901	
%	64	13	.6	1	1	.6	2	7	-	10	.2		100
Total	3906	789	24	84	72	28	142	378	-	483	10	5916	
%	66	13	.5	1	1	.5	2	6	-	8	2		100

Table 44. Concentration indices for selected artifacts and debitage from Blocks A and B at 34Pu-73.

	Block A						Block B							
Arbitrary Levels (10 cm)	1	2	3	4	5	Total	1	2	3	4	5	6	7	Total
On-Mound:														
Number of Excavated Levels	15	10	10	5	1	41	4	4	4	4	3.5	2.5	.25	22.25
Flake Count	8231	4988	2834	1151	79	17,283	3369	3319	2028	1562	879	353	19	11,529
Flake CI	549	499	283	230	79	-	842	830	507	391	251	141	76	-
Artifact Count	142	84	46	19	1	292	32	33	20	36	21	6	1	165
Artifact CI	9.5	8.4	4.6	3.8	1.0	-	8	8.2	5	9	6	2.4	4	-
Off-Mound:														
Number of Excavated Levels	9	8.5	8	4.5	.5	30.5	10	10	9	4.5	2.5	1	-	37
Flake Count	2691	1683	855	299	17	5,545	3601	2143	741	323	187	35	-	7,030
Flake CI	299	198	107	66	34	-	360	214	82	72	74.8	35	-	-
Artifact Count	29	26	11	5	1	72	41	29	13	4	4	-	-	91
Artifact CI	3.2	3.0	1.4	1.1	2.0	-	4.1	2.9	1.4	.9	1.6	-	-	-

debitage (Tables 42 and 43). Types J, B, and H are the next most frequent materials. The presence of water-worn cortex on many of the artifacts and flakes suggests that these materials were procured from stream gravels.

INTRASITE COMPARISON

An examination of the horizontal distribution of Block A cultural material reveals an interesting pattern. Material quantities from the on-mound excavation units appear higher than those from off-mound squares (Table 39). Since the 1978 excavations focused primarily on exposing the on-mound features, the amount of work varied across Block A. To facilitate on/off-mound comparisons, Concentration Indices (CI) which indicate densities-per-level have been calculated for debitage and artifacts (Table 44). Materials from the surface and the off-mound waterscreen square (A10-24) have not been included for this analysis. The indices for each 10 cm level are computed by dividing the artifact or debitage totals by the number of excavated levels.

Using these values, a significant difference between the two areas is observed. On-mound CI values are greatly increased. A noticeable decline in CI values occurs between Levels 2 and 3 for both portions of Block A (Table 44).

Most of the chipped stone artifacts *(01)*, all of the ceramics *(02)*, and all but one of the ground *(03)* and pecked stone *(04)* artifacts occur on the mound. Interpreting this concentration of cultural remains is complicated by the presence of two rock features on the Block A mound and by extensive bioturbation. The rock features lack well defined vertical boundaries and the associated soils do not appear oxidized although flecks of charcoal and burned clay are scattered throughout the matrix. The densely packed sandstone fragments from Feature 78-6 appear thermally altered. However, few of the sandstone fragments from Feature 78-2 seem to have been thermally altered and these rocks are loosely scattered throughout the deposit. This suggests that, although these features may have been originally related to activities involving burning, they do not appear to be in primary depositional context.

It is possible that this mound represents a cultural refuse area. The association of diverse artifact classes with these features may be fortuitous. Most of the chipped stone artifacts are broken. In addition, the complete bifaces exhibit numerous step and hinge fractures which may indicate that these items were rejected from further reduction. A majority of the ground *(03)* and pecked *(04)* stone implements are also broken.

The sizeable quantity of lithic debitage recovered from the mound complicates this interpretation. This is especially evident for Feature 78-6 (A57-10, A57-11, A58-7, and A58-15). Level 1 from each of these squares has produced between 575-750 flakes in association with this dense concentration of rock. It is possible that lithic manufacturing debris from other parts of this locus was redeposited on the mound.

An alternative explanation is that the mound represents both a prehistoric refuse area and an area for lithic manufacturing and maintenance activities, and for undetermined processing activities. Subsequent reoccupations of the mound served to modify the matrix so that distinct mound activities can no longer be discerned.

Attempts to explain the culture history of Block A is complicated by extensive bioturbation, the presence of rock features on the mound, the concentration of a major portion of the cultural inventory on this mound, and a lack of radiometric dates. Charcoal collected at 18 cm below ground surface from Feature 78-2 (A54-3) was submitted to the University of Georgia, Center for Applied Isotope Studies. A date of modern was determined from this sample (UGa-2531).

An inventory of the Block A artifacts was presented in Table 39. Diagnostic artifacts such as large points, small (arrow) points, and ceramics occur throughout the upper 40 cm of the deposit. Many of the large point styles are temporally insensitive. However, two components are tentatively suggested for this area.

A late component is characterized by grog tempered ceramics *(02-01-01A* and *02-01-02D)*, a small point *(01-01-06E)*, and four small point segments *(01-12-01A)*. The majority of the large contracting stemmed points *(01-01-01A)* are from the upper 20 cm of the deposit and it is likely that some of these implements are associated with this component. Presumably some of the remaining chipped stone artifacts are included in this artifact assemblage. Hunting, lithic manufacturing, resource processing, and possibly storage are inferred activities. This component is believed to represent a minor occupation of the site during the Woodland or early Caddoan periods.

An earlier occupation is indicated by the numerous large expanding stemmed/corner-notched points *(01-01-02)*, and large straight stemmed varieties *(01-01-04)*. These styles are generally associated with the Archaic period. It is believed that the major occupation at Block A relates to this period. It is possible that some of the large contracting stemmed points *(01-01-01A)*, the large unstemmed point *(01-01-05B)* and some of the biface categories should be included within this assemblage. The duration of this occupation is unknown as are activities other than resource processing and lithic manufacturing.

Unfortunately, it could not be determined whether the drill *(01-02-03A)*, wedges *(01-03-01A)*, thick biface tool *(01-11-02A)*, ground stone *(03)* and pecked stone *(04)* implements were used throughout the occupation of Block A or confined to one of the components.

SUMMARY

Block A at 34Pu-73 appears to be multicomponent. Unfortunately, radiometric dates are not available. Lithic manufacturing is viewed as a major activity since artifacts suggestive of all stages of the reduction

sequence are present. Additionally, it is argued that many of the large points were used in on-site processing activities and subsequently reworked and/or resharpened. Wedges *(01-03-01A)*, a thick biface tool *(01-11-02A)*, a drill *(01-02-03A)*, and numerous modified flakes *(01-13-01B)* also indicate involvement with extractive and/or processing activities. The processing of floral resources is inferred by the presence of manos *(03-01-01A* and *03-01-02A)* and several ground and pecked stone varieties *(03-06-03A, 04-02-01A*, and *04-03-01A)*. The function of the ground slate fragment *(03-06-03B)* is unknown.

Block A is believed to represent a special purpose camp based on the limited variety of activities suggested by the data. Lithic manufacturing, tool maintenance, hunting, and resource processing are viewed as major activities during some portion of the area's occupation. The two rock features may represent prehistoric refuse areas or refuse/activity areas. However, their cultural affiliation could not be determined.

Block B

Artifact class frequencies for this block closely mirror those calculated for Block A (Tables 39 and 40). Excluding debitage, chipped stone artifacts constitute 94% of the cultural remains. Ground and pecked stone (5%) and ceramics (1%) comprise minor proportions of the artifact assemblage.

Seven percent of the chipped stone artifacts are points. Large contracting stemmed points *(01-01-01A* and *01-01-01C)* and large expanding stemmed/corner-notched varieties *(01-01-02)* are dominant. Seventy-four percent of the points are broken. An impact fracture occurs on one specimen. At least 76% of the large points are reworked or resharpened. As discussed previously, these data are suggestive of on-site maintenance and the utilization of these implements in a variety of processing activities.

Lithic manufacturing is believed to be a major activity in this area (Table 40). The three reduction strategies outlined previously are represented in the chipped stone sample from Block B. In addition, artifacts suggestive of all stages of the lithic reduction continuum are present.

Tables 41, 42, and 43 provide information regarding lithic material type frequencies for chipped stone artifacts and debitage. Two excavation units (B26-13 and B27-12) were used to calculate debitage material type percentages. Both data classes reflect the predominate use of locally available materials. Non-local materials (Type K) occur infrequently for both the artifacts (1%) and debitage (2%). Boone chert is the only identified non-local material. Type A is the most prevalent material for both artifacts (55%) and debitage (66%). Rounded cortex on the artifacts and debitage suggests that local materials were procured from stream gravels.

INTRASITE COMPARISON

Table 40 presents Block B cultural remains in respect to on/off-mound distributions. Concentration Indices (CI) were calculated to facilitate comparisons between the areas since more off-mound squares were excavated. One of the five on-mound squares (B28-19) is the waterscreened unit. Since material quantities from this square are not comparable with those recovered from the dry screened units, they are not included in the CI values.

Table 44 provides the CI values calculated for Block B and indicates significant on/off-mound differences in artifact and debitage densities. On-mound indices for both data classes are large throughout the occupational history of this area. High artifact and debitage CI values for Levels 1 and 2 and a noticeable drop in Level 3 indices are observed both on and off the mound (Table 44). However, the on-mound artifact CI value increases sharply in Level 4 and remains elevated in Level 5. A noticeable decline in both artifact and debitage CI values is indicated again in Level 6. This on-mound bimodal distribution is somewhat mirrored off the mound since a slight increase in artifacts and debitage indices is observed in Level 5.

Based on the indices data as well as the vertical distribution of certain artifact categories, two components may be suggested for Block B. No stratigraphic differences distinguish these components. In addition, the mound is believed to represent the main occupational area since it contains the deepest cultural deposit and the highest frequency of artifacts and features. A variety of activities such as processing, lithic manufacturing, and tool maintenance are believed to have centered on the mound area. Interpretations are complicated by the lack of radiometric dates and the possibility of some mixing of materials due to bioturbation and the excavation of arbitrary levels.

The earlier component includes materials recovered from *ca.* 30 cm to 70 cm below ground surface. The artifact assemblage associated with this component is characterized by large expanding stemmed/corner-notched *(01-01-02)* and large straight stemmed *(01-01-04A)* points, and a lack of ceramics *(02)* and small (arrow) points. Large contracting stemmed *(01-01-01A)* points are considered minimally associated with this assemblage (Table 40). The presence of a single sherd *(02-01-03A)* in Level 4 is believed intrusive. This component is tentatively assigned to the Archaic period.

Features 78-3 and 78-4 are believed to be associated with this component. These well sorted concentrations of sandstone fragments with well defined boundaries are located in the Block B mound. Feature 78-4 occurs slightly lower than Feature 78-3 and may represent an earlier occupational feature. Artifacts associated with these features include: thick bifaces *(01-10-02A)*, a cobble/block biface I *(01-10-01A)*, a grinding slab *(03-02-01A)*, a ground stone fragment *(03-06-03A)*, and a unifacial pitted cobble *(04-02-01A)*. These features appear to be in a primary depositional context but their function has not been determined. They are similar to rock concentrations associated with the proposed Archaic component at 34Lt-32.

An inventory of the artifacts associated with the earlier component suggests that lithic reduction is a major activity (Table 40). Artifacts suggestive of testing/procurement, initial modification, and secondary shaping and thinning have been recovered. The majority of the points have been reworked and may indicate on-site implement maintenance. As discussed previously, many of the points may have been employed in processing activities.

Other processing implements associated with this first component are modified flakes *(01-13-01B)* and a variety of ground stone *(03-02-01A* and *03-06-03A)* and pecked stone artifacts *(04-02-01A)* artifacts. These latter items may have been utilized in the processing of vegetal resources.

The second component tentatively proposed for Block B is restricted to the upper 30 cm of the deposit. The associated artifacts are characterized by a predominance of large contracting stemmed points *(01-01-01A* and *01-01-01C)*. Other point styles occur infrequently and include: large expanding stemmed/corner-notched varieties *(01-01-02A* and *01-01-02C)*, a large straight stemmed point *(01-01-04A)*, and two biface segments *(01-12-01A)* which are believed to represent small (arrow) point fragments. Ceramics *(02-01-01A* and *02-01-03A)* are minimally represented and are generally a grog tempered plainware (Table 40).

The quantity of chipped stone suggests that lithic reduction was a major activity during this occupation. All stages of the reduction continuum are represented. On-site implement maintenance is suggested by the high incidence of reworked points. Drills *(01-02-01)*, a thick biface tool *(01-11-02A)*, many of the reworked/resharpened points, and the numerous modified flakes *(01-13-01B)* suggest involvement with on-site extractive and processing activities.

A variety of ground stone implements *(03-01-00* and *03-06-00)* are associated with this component and are interpreted as tools for processing vegetal resources. The function of the tabular ground slate fragment *(03-06-03B)* and a pecked quartz nodule *(04-03-01A)* is unknown.

Feature 78-1 appears to be associated with the later component at Block B. This rock concentration resembles Feature 78-3 and 78-4 in sorting, size, and arrangement. The function of this rock cluster could not be determined.

This component may relate to either the Woodland or early Caddoan periods. Finer placement within this post-Archaic period is not possible since absolute dates are lacking. In addition, many of the artifacts used to segregate this component have been reported in association with both periods (Galm 1978b: 51-52; Galm and Flynn 1978: 116-117; Bell 1972: 228; Rohrbaugh 1973: 7, 20, 79; Wyckoff 1970a: 98).

SUMMARY

The data recovered from 34Pu-73, Block B suggest at least two components. Based on associated point varieties, the earlier component is tentatively assigned to the Archaic period. The later occupation of Block B occurred during either the Woodland or early Caddoan periods. Lithic manufacturing and implement maintenance are believed to be major activities in both components. In addition, on-site resource processing is inferred from the presence of a variety of artifacts exhibiting wear and probable resharpening. Hunting and floral resource processing are also indicated.

Based on the limited variety of activities suggested by these data, this area may represent a special purpose camp during all periods of occupation. In addition, the mound area is believed to be the central occupation area for lithic manufacturing, implement maintenance, and resource processing. The function of the rock concentrations associated with both components could not be determined.

CONCLUSION

The 1978 investigation of 34Pu-73 indicates two separate occupational loci which are characterized by multiple occupations, and by pronounced differences between on/off-mound areas based on artifact concentrations and feature location. However, features from the two block areas are distinctive. The three Block B features generally contain larger sandstone fragments, have better defined boundaries, and show no evidence of thermal alteration as indicated by burned clay, charcoal, or burned rocks.

The two rock concentrations in Block A may represent cultural refuse areas or refuse/activity areas. The function of the possible pit (Feature 78-5) could not be discerned. Component affiliation of these Block A features is uncertain. Block B rock features seem to be in a primary depositional context and are associated with both components. Their function remains unknown. Both areas are interpreted as representing repeatedly occupied special purpose camps. Lithic manufacturing, tool maintenance, hunting, and resource processing are inferred activities for both areas. The earlier component at each block area is believed related to the Archaic period. The later component at both areas may represent either Woodland or early Caddoan period occupations.

CHAPTER 11

THE BLESSINGAME SITE (34Pu-74)

Christopher Lintz

INTRODUCTION

The Blessingame site[1] is on a prominent terrace approximately 15 m west of Buffalo Creek and 270 m north of the present Jackfork Creek channel. An older channel of Jackfork Creek, 50 m south of the site, is suggested by the regional topography. The confluence of Buffalo and Jackfork creeks is about 1000 m southeast of 34Pu-74. Located at an elevation of 573 feet (175 m), this site covers a 200 m by 150 m area and is approximately 8 m above Buffalo Creek and 11 m above Jackfork Creek.

The prominent terrace stands in marked contrast to remnants of the same terrace further up Buffalo Creek. A linear rock outcrop at the north end of the terrace is oriented approximately N 130°E and dips sharply to the southwest. This has served as a natural levee and prevented Buffalo Creek from eroding the terrace. The terrace abruptly drops to the north, east, and south and gradually slopes to the southeast. Cultural materials are scattered across the entire terrace. Minor lateral erosion at one place along the east slope naturally seperates the level terrace into two areas. The north area has a low east-west linear mound in the middle (Fig.34a). The southern area is relatively level, but has numerous small circular mounds spaced at irregular intervals (Fig.35).

The site is in tall grass pasture. A galleria forest is supported on the Buffalo and Jackfork floodplain adjacent to the terrace. Mature deciduous trees (oaks and hickory) on the terrace may be residuals left from a secondary growth following early lumbering activities in the region.

Contrary to previous reports (Neal 1972: 8; Bobalik 1977: 490), the terrace has never been cultivated. Mr. Blasingame indicated that a dense stand of trees covered the site until the 1940s. A number of depressions from up-rooted trees are still visible on most areas of the site. The trees were selectively removed. A few taller ones were left to shade livestock. Brush and stumps were piled and burned on the terrace and then pushed over the edge. Charred logs protruding from mounds of earth on the

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[1]The site was on the farm of Mr. Blasingame, but through an error, was transcribed as Blessingame during the original survey. This error is retained here except in reference to the former landowner, with our apologies.

lower terrace slopes indicate that burned trees from the north area were pushed toward the north and those from the south area were pushed toward the east. The amount of disturbance and removal of culture bearing deposits from the terrace during the clearing activities is uncertain. All earthen mounds on the lower slopes with burned logs contain abundant cultural materials.

A number of other historic activities occurred in the immediate site area. A barbed wire fence across the western portion of the site encloses the south area. A wood corral and holding pen with a loading chute is in the northwest corner of the fenced area. A small covered feeder and water trough are in the northeast quarter of the same pasture. A road from the loading chute parallels the fence and goes toward a collapsed barn, well, and old house structure northwest of the site. Prior to dam-related construction activities, a high voltage power line was built beyond the fenceline across the western edge of the site.

The site was found during the reservoir survey (Neal 1972: 7), and subsequently tested (Bobalik 1977: 488). Twelve post hole tests along four transects and seven random post hole tests in the northeastern portion of the site were used to assess the depth and nature of subsurface deposits. Two 1 m test squares were later excavated in 10 cm intervals to provide greater vertical control of the deposits. Test Square 1, located in the northeast quarter of the southern area, produced a unimodal vertical distribution of cultural debris, which extended deeper than 50 cm. Test Square 2 was excavated on top of the prominent ridge in the north area (Fig. 35). It produced an angular rock feature (76-1) in the upper 20 cm, and a trimodal vertical distribution of materials (Bobalik 1977: 495). Charcoal from the feature yielded a date of A.D. 1730 ±100 (UGa-1518). However, the absence of late prehistoric artifacts types led Bobalik (1977: 515) to conclude that the sample "may have been mixed with recent materials". Considering the method of timber clearing and the shallow feature depth, contamination may be likely.

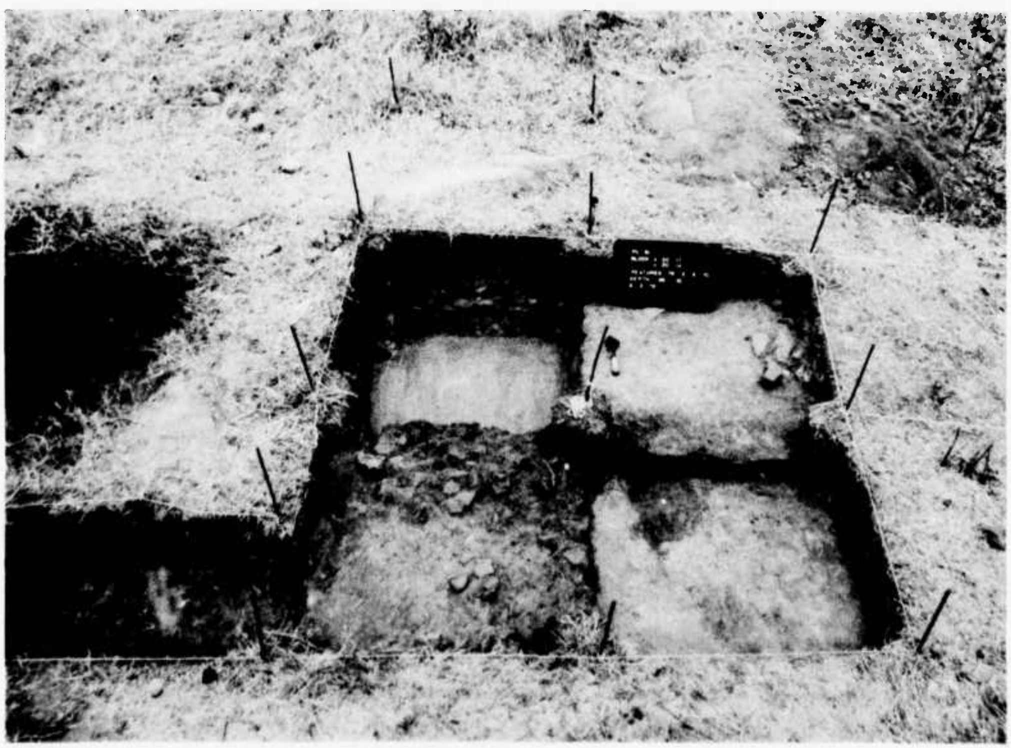
The variety of artifacts found during survey and testing suggested at least two occupations for the site. The presence of a stone pipe stem from the surface and an arrow point *(Bonham)* from the upper levels of Test Square 2, led Bobalik to postulate a Woodland or early Caddoan occupation for the upper component. A stem section from an unnamed large straight stemmed point from the lower levels suggested an earlier component, perhaps Archaic. This component was believed to be a special purpose (extractive) camp, while the later Woodland/early Caddoan component was thought to be a base camp (Bobalik 1977: 565, 569, 572). The suggested range of activities appeared to be limiting to hunting, nut procurement, and lithic reduction (Bobalik 1977: 517).

The site was recommended for additional work because it is at a major river juncture in the valley and potentially could provide information on Archaic, Woodland, and early Caddoan activities. Although originally within the designated limits of a borrow pit needed for dam construction, the site was placed on limited restriction until archaeological excavations could be completed. Nevertheless, construction

Fig. 34. a: Site photograph of North Terrace Mound Area at the Blessingame site (34Pu-74). View is to the northeast.

b: Relationship of Features 78-6, 78-8, 78-10, and 78-3 in North Terrace Mound. Note 1976 Test Pit 2 in left center portion of photo. View is to the north.

a



b

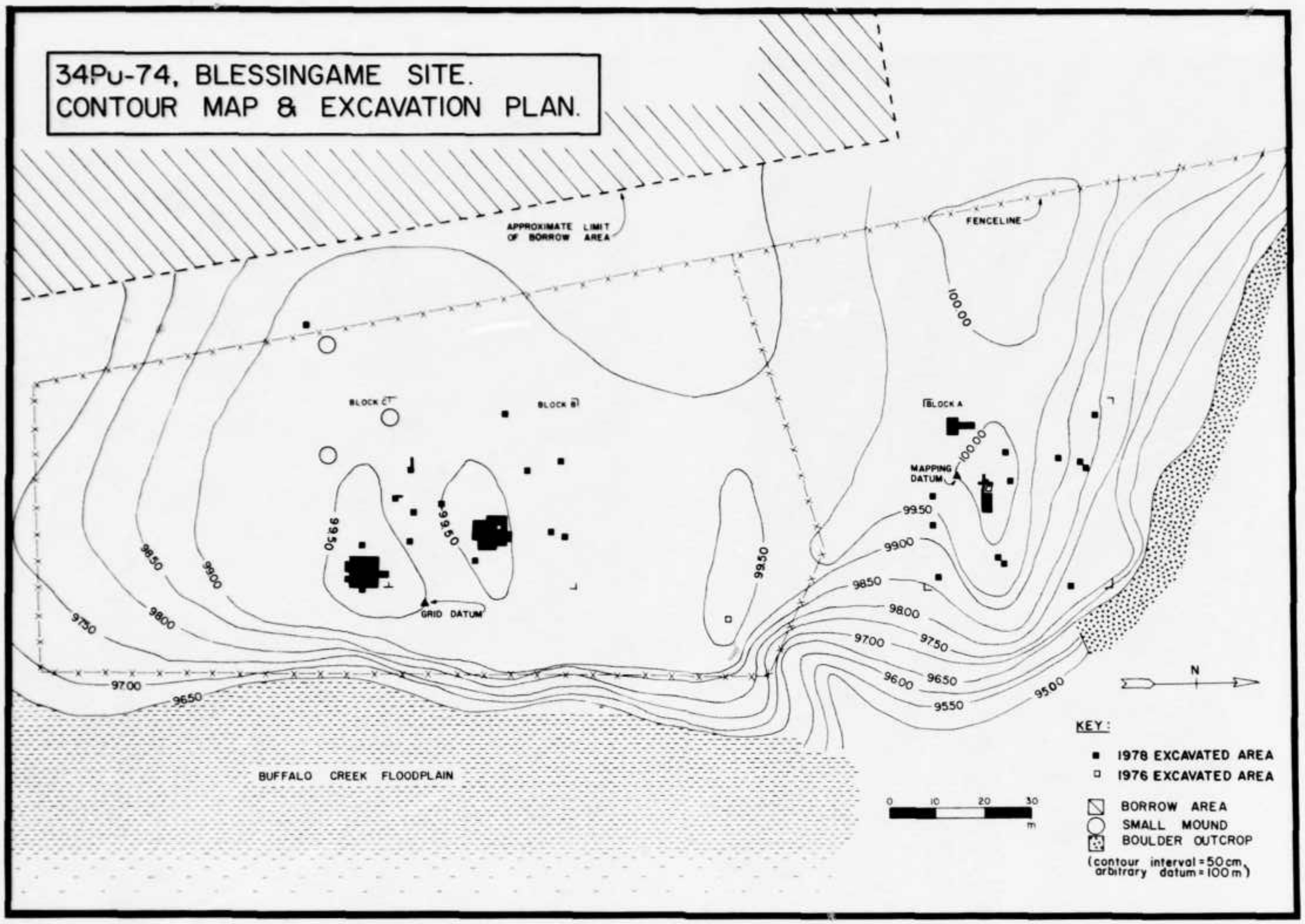


Fig. 35. Contour map and excavation plan of the Blessingame site (34Pu-74).

activities removed fill from part of the site west of the fence and dug a backhoe trench within the fenced south pasture to evaluate gravel deposits on the terrace. The power line was also removed.

EXCAVATION STRATEGIES

The 1978 excavation strategy at 34Pu-74 was directed at answering a series of questions generated from the earlier testing phase. They include:

1. How many occupations or components are represented at the site?

2. What are the ages of the occupations and how do they relate to the generalized culture sequence tentatively defined for the valley?

3. What are the intrasite activities conducted during each component or occupation?

4. Do the kinds of activities change through time?

5. Can the postulated base camp function of the site be supported and documented?

Other specific questions raised by Bobalik (1977: 567-574) can only be addressed tangentially. Answers to most of these questions depend on either the recovery of perishable floral, faunal, or palynological information or the compilation and comparison of assemblages and locational information from a number of different sites in the valley. Previous attempts to recover perishable materials from sites in the Jackfork Valley have met with limited success (Bobalik 1977; 1978).

Previous testing indicated two areas of the site with high density of cultural debris: the east-west ridge in the north terrace area and a broad area near the east edge within the fenced pasture of the south terrace area (Bobalik 1977: 492). Testing from the eroded slope between the north and south areas produced a small amount of materials. Two grid blocks were initially superimposed over the site since the areas with high material concentrations were thought to reflect activity areas which potentially could yield cultural features (Fig. 35).

Block A was centered over the prominent ridge in the north portion of the site. However, additional squares had to be excavated in order to accommodate the numerous features encountered. Features 78-1 through 78-4 were found during excavation of the random test squares. The control square (A20-16) was placed on the ridge east of Test Pit 2 excavated in 1976 in order to further expose Feature 76-1. Although this feature was not relocated, two different features (78-6 and a continuation of 78-3) were encountered. Seventeen additional test squares and five half squares (1 m by ½ m) were nonrandomly placed in Block A to expose and explore feature relationships. These squares located three features (78-8, 78-9

and 78-10). Eight cultural features were found in the 20 squares and five half squares excavated in Block A.

Block B is 80 m south of Block A. Only three features (78-5, 78-11 and 78-22) were recognized during excavation of the 12 random squares. The control square (B34-5) was placed on top of a low mound close to Feature 78-5. The recognition of post holes in the control square and below 78-5 suggested the presence of a structure corresponding to the low mound. Forty-one additional squares were needed to define the structure's size, shape, and orientation. Rock features 78-14 and 78-23 were encountered during the excavation of Structure 1. Three additional "half squares" were excavated to sample Feature 78-11. A total of 53 test squares and three half squares was excavated in Block B.

With the discovery of Structure 1 corresponding to a low mound in the south terrace area, excavations concentrated on the upper deposits to answer some of the following questions:

1. Do prehistoric structures correspond to the numerous small mounds in the south terrace area?

2. What are the size, shape, and orientation of the structure(s)?

3. How many structures are present and what is the community pattern relationship between the structures?

4. What are the ages and cultural affiliations of the structures?

5. Are the structures contemporaneous or sequentially occupied?

6. What are the feature relationships, if any, between Blocks A and B?

In an effort to determine whether structures correlate to low mounds, additional Blocks C, D, and E were assigned to a 40 m (north-south) by 120 m (east-west) area immediately south of Block B. Limited testing was conducted on only two mounds. Although no structural remains were encountered in the single square placed in Block E, a second structure was found in a low mound within Blocks C and D. A total of 43 squares were required to fully expose Structure 2. The results correlating structures to mounds are inconclusive. Some of the other mounds at 34Pu-74 probably represent structures, but there was insufficient time to find and expose them or to delineate the community pattern. These problems will be addressed during the 1979 excavations.

Altogether, 127 squares and eight half squares were excavated and dry screened. Two additional squares were waterscreened as control units. A total of 23 feature numbers was assigned, but not all related features within the structures were given numbers. The 1978 excavations sampled an estimated 0.04% of the total site area.

STRATIGRAPHY

The stratigraphy at 34Pu-74 is geologically and culturally complex. Portions of the terrace were deposited as separate geological events, probably during the Pleistocene. The southern area is a gravel terrace while the north terrace area is composed of a fine sandy loam, generally devoid of gravels. The origins and relationship between these different deposits are presently unclear and are of little archaeological significance since the terrace age is believed to be older than aboriginal use of the valley. Post-depositional soil development has occurred in both areas. However, variations in soil texture, particle size and composition has caused differential soil weathering between the two areas. General correlations above the oldest soil horizons cannot be confidently made on stratigraphic information alone.

Cultural activities on the terrace have also selectively modified portions of the site. The recent clearing activities across the entire terrace have differentially removed a significant portion of A horizon deposits and have increased bioturbation through the up-rooting of trees. Prehistoric cultural modification of the strata is apparent at several places on the terrace. Most obvious is the linear mound in Block A which is .68 m higher than the surrounding area and where five cultural features were found stratigraphically superimposed. Some culturally derived strata are restricted to the mound area, but most strata within the north terrace area can be correlated on and off the mound.

The complex stratigraphy requires separate descriptions for the north and south terrace areas (Fig. 36). All color descriptions are based on dry soil conditions.

NORTH TERRACE DEPOSITS

Six strata were identified within Block A, although some were areally restricted. Some cultural features (78-6 and 78-9) may have been truncated by the clearing operations which also removed an unknown amount of upper soil from the north terrace area. Cultural materials were confined to the upper three strata.

Stratum I

This unit is areally limited to the low linear mound in the middle of Block A. It is characterized by a relatively loose dark gray brown (10YR 4/2) sandy loam with numerous marble-sized pieces of gravel, and has a depth of 15-25 cm. Abundant cultural materials, charcoal flecks, and small gray and yellow ash nodules occur throughout this stratum. Two rock hearths (F78-6 and F78-9) crosscut this unit.

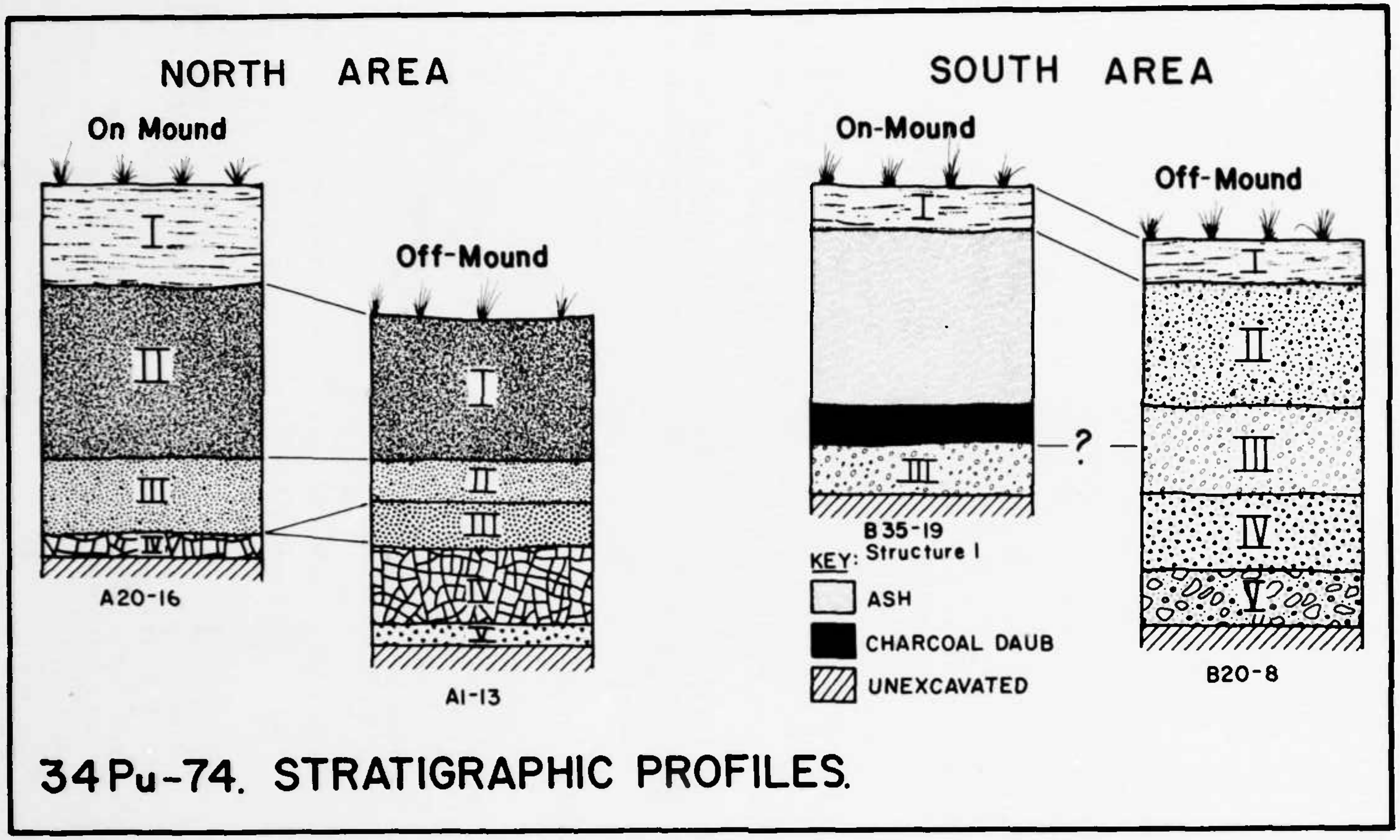


Fig. 36. Stratigraphic profiles from the Blessingame site (34Pu-74).

Stratum II

This stratum is found at 15-45 cm below surface within the mound, but corresponds to the upper stratum (0-18 cm) in areas peripheral to the mound. It is a moderately compact grayish brown (10YR 5/2) sandy loam. Feature 78-8 cuts through this stratum, but two angular rock concentrations (78-3 and 78-10) occur within this unit. Cultural materials are abundant.

Stratum III

This stratum ranges from 45-65 cm deep within the mound but has a depth of 18-24 cm off the mound. It is a moderately compact very pale brown (10YR 7/4), sandy loam with occasional pieces of small gravel. The unit is mottled with gray-brown soil, presumably due to krotovina from the above stratum. This unit contains cultural materials, and Feature 78-2 occurs in the lower portion of the stratum.

Stratum IV

This unit was not observed within the mound area, but was 24-32 cm deep in areas adjacent to the mound. It consists of a compact reddish yellow (7.5YR 6/6) clayey loam which is devoid of rocks and gravels. The transition between Strata III and IV is gradual. This unit is culturally sterile.

Stratum V

This unit underlies Stratum III in the mound area (deeper than 65 cm), and is beneath Stratum IV in areas adjacent to the mound at depths ranging from 32-44 cm. It is a compact clayey loam with a homogenous yellowish red (5YR 5/8) color. This unit is culturally sterile.

Stratum VI

This unit is an old weathered soil characterized by a compact yellowish red (5YR 5/8) clayey loam with pedogenic structures mottled in red (2.5YR 4/8) and yellowish brown (10YR 6/6) colors. This unit was encountered 44 cm deep in peripherial mound areas below Stratum V, and is culturally sterile.

SOUTH TERRACE DEPOSITS

Five strata were recognized in most of the squares in the south terrace area (Blocks B and C). The following description is from B20-8. It is thought to be representative since the square is located between the low mounds and no cultural features were found which potentially could modify the strata. These strata can be correlated to units in other test squares although their thickness may vary. Cultural materials were confined to the top four strata.

Stratum I

This unit is characterized as a dark brown (10YR 4/3) fine fraction loam with numerous rootlets. It is confined to the upper 9 cm, but additional deposits may have been removed during recent clearing. Minute charcoal flecks were rarely observed in this upper unit. The significance of this is uncertain since charcoal could relate to recent burning or prehistoric activities. Cultural materials were abundant.

Stratum II

This unit ranges from 9-30 cm deep and is characterized by a compact dark yellow brown (10YR 4/4) loam interspersed with occasional small pebbles. Cultural materials were abundant.

Stratum III

This unit ranges from 30-47 cm below surface and is identical to Stratum II in color (10YR 4/4) and compact loamy composition. However, this stratum contains more and larger sized pebbles and gravels. Cultural materials were abundant.

Stratum IV

This unit ranges from 47-62 cm below surface. The soil is a strong brown (7.5YR 5/6) clayey loam with abundant large gravels and occasional rocks. Abundant artifacts and debris were recovered from this stratum.

Stratum V

This unit extends deeper than 62 cm, and like Stratum IV the soil is

a strong brown (7.5YR 5/6) clayey loam. This unit differs in the size (4-10 cm diameter) and abundance of large stream rolled chert nodules. The presence of clay accumulations and pedogenic structure indicates that this unit has an old soil genesis which is weathered. The small amount of cultural debris is believed to be intrusive. The presence of peds suggests that this unit may correlate with Stratum IV in the north portion of the site.

FEATURES

Twenty-three features were assigned numbers during the 1978 excavations. Several post holes associated with larger structures were not assigned individual numbers. Major feature types include pits, rock hearths, horizontal rock concentrations, miscellaneous, and structures. The constellation of features comprising the two structures include ash, charcoal stains, charred posts, and daub corresponding to fill on the floor as well as centrally located clay hearths and wall and interior support post holes. The correlation of features to the different stratigraphic profiles requires separate descriptions of features in the north and south terrace areas of the site. Artifact types associated with each feature are provided in Table 45.

NORTH TERRACE FEATURES

Features from the north terrace area of the site include one ash filled pit, two rock hearths, three horizontal rock concentrations, and two miscellaneous features.

Ash Filled Pit

Feature 78-8 (Figs. 34b; 37)

This feature is a basin shaped pit located in the mound area between A20-14 and A20-17. An oval orifice measuring 66 cm north-south by 46 cm east-west was observed immediately below Stratum I at a depth of 23 cm. The interior configuration of the pit changed to an elliptical shape with the deepest point occurring near the western orifice edge at 55 cm. The fill matrix was a dark brown moist sandy loam with abundant ash, occasional flecks of charcoal, and orange-yellow baked clay particles. This feature crosscuts Stratum II and terminates in Stratum III.

Table 45. Selected artifacts and debitage associated with features at 34Pu-74.

Artifact Variety	North Area Features								South Area Features						Total
	78-8	78-6	78-9	78-2	78-3	78-10	78-1	78-4	78-11	78-14	78-22	78-23	Structure 1	Structure 2	
01-01-01A	1	2	1		3	1								1	9
01-01-02B													1		1
01-01-02L									1						1
01-01-02M									1						1
01-01-02R		1													1
01-01-04A				1	1										2
01-01-05A					1										1
01-01-06A		1						1							2
01-02-01C				1									2	1	4
01-02-03A		1													1
01-05-01A								2							2
01-09-01A													1	1	2
01-10-01A	1	1		5	1				1	1					10
01-10-02A	7	10		8	4	7		3	3	1		1		7	51
01-10-03A	4	3	1	3	1	2		1	2		1		1	4	23
01-10-04A-*L*	2	2		1											5
01-10-05A-*L*	2	2		1	1										6
01-12-01A-*L*	1	6	1	7	7	2	1		2			1		4	32
01-13-01A	1	1		1		2									5
01-13-01B	3	9		13	6	4	3	1							39
01-14-01A	1				1									1	3
01-15-01A							1								1
01-15-02A				2	1	1	1				1		1	1	8
01-16-02A					1										1
03-01-01A														1	1
03-01-02A									2						2
03-06-01A														1	1
04-02-01A														2	2
04-04-02A								1							1
04-04-04A													1		1
07-03-05A				2											2
07-03-06A				1											1
Total	23	39	3	46	28	19	6	9	12	2	2	2	7	24	222

L indicates large artifacts of a particular variety.

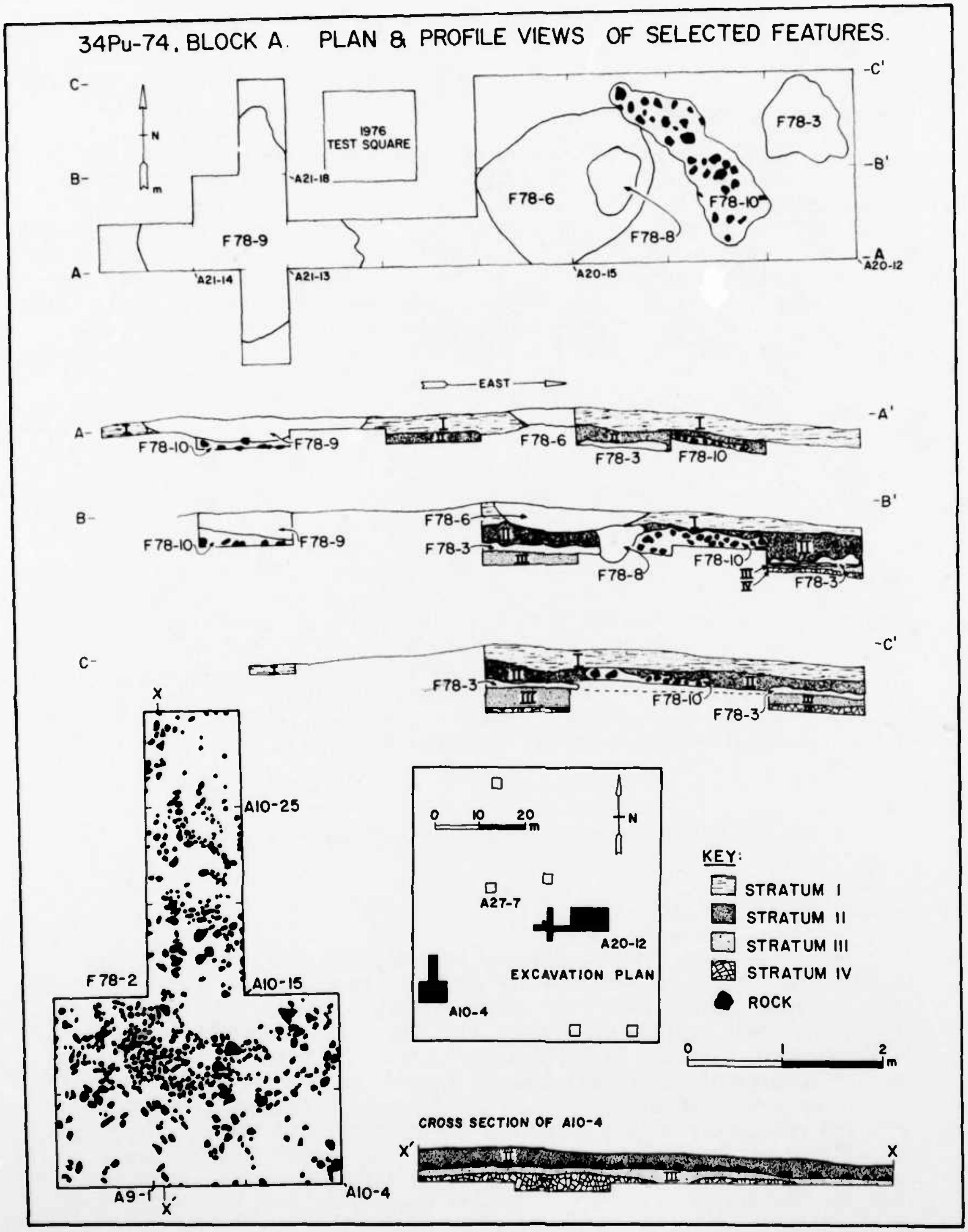


Fig. 37. Plan and profile view of North Terrace Area Features at the Blessingame site (34Pu-74).

Rock Hearths

Feature 78-6 (Figs. 34 b; 37)

This feature is a shallow basin shaped pit on the mound near A20-15. It is 140 cm north-south by 150 cm east-west and extends from immediately below the grass zone (5 cm) to a maximum depth of 25 cm within Stratum I. An unknown amount of the upper portion of the feature may have been removed by recent land clearing. The fill matrix was a loose dark gray and black sandy loam containing ashy charcoal residue and numerous spalls and angular pieces of sandstone. The matrix showed extensive burning in a primary contextual situation. An uncorrected radiocarbon date of A.D. 30 ±60 (Tx-3264) was obtained from 10.5 g wood charcoal associated with the feature.

Feature 78-9 (Fig. 37)

This feature is the same as rock feature 76-1 found during the previous testing phase (Bobalik 1977: 491). It is near A21-13, approximately 1.75 m west of Feature 78-6 along the same prominent ridge. A series of half squares was used to define the horizontal extent of the feature. The size and fill matrix of this feature closely resembles that of Feature 78-6. Angular fire cracked sandstone nodules and spalls were confined to an area 240 cm by 230 cm. However, the ashy and black sandy loam was restricted to a 165 cm by 140 cm area. The feature occurred between 6 cm and 25 cm below surface in a primary context. An uncorrected radiocarbon date of A.D. 1730 ±100 (UGa-1518) was obtained in 1976 from 6.1 g of wood charcoal. A 13 g sample of wood charcoal obtained during 1978 provided a date of A.D. 1450 ±40 (Tx-3282).

Horizontal Rock Concentrations

Feature 78-2 (Fig. 37)

This feature is a horizontal concentration of rocks found in nine squares near A10-6 southwest of the mound. The rocks are scattered across an area larger than 5 m by 3 m and occur at a depth of 7-15 cm. All are in the lower portion of Stratum II. The rocks appear to be selected by shape, material, and size characteristics. Most are rounded or subangular nodules of low grade, hightly flawed, orange and red chert which range from 4-9 cm in diameter. Some nodules show thermal fissures and gray and red cortex colors which may indicate an association with fire. The absence of an oxidized ground surface, small chert spalls, and charcoal flecks in the fill matrix surrounding the rock concentration suggests that the feature represents a secondary deposition from some other area of the site.

Feature 78-3 (Figs. 34 b; 37)

This feature is a dense concentration of rocks underlying the mound. It was selectively exposed in A20-14, 20-16, 20-19, and 21-13 at a depth of 34-45 cm at the boundary of Strata II and III. The feature dimensions are greater than 7 m by 2 m. The rocks are horizontally scattered on a level surface which does not correspond to the rise of the mound. Unlike Feature 78-2, rocks in this feature are angular, rounded and tabular, and display a wider range of types. Most are sandstone and siltstone, but a few low grade chert nodules also occur. Their diameter ranges from 6-11 cm. The presence of fissures and orange and red colors suggests thermal alteration. However, the absence of small spalls and charcoal flecks may indicate a secondary depositional context.

Feature 78-10 (Figs. 34 b; 37)

This feature is stratigraphically above Feature 78-3 within the middle of Stratum II. It is confined to an 180 cm by 80 cm area within A20-13, 20-14, 20-17 and 20-18 at a depth of 28-36 cm. The rocks are not continuous, and cluster primarily in two areas corresponding to A20-13 and 20-18. The rock shapes are restricted to angular and rounded nodules of low quality, highly flawed chert similar to those found in Feature 78-2. The size ranges from 5-15 cm in diameter. Many rocks show fissures and gray to red cortex indicative of thermal alteration, but the absence of discrete clustering, an oxidized soil matrix, and small spalls may indicate a secondary depositon. Charcoal was scarce, but a 9 g sample of charred wood associated with the feature yielded an uncorrected radiocarbon date of A.D. 1775 ±75 (UGa-2534).

Miscellaneous Features

Although feature numbers were assigned to these anomalies, their origins are not believed to be cultural.

Feature 78-1

This soil anomaly appears at a depth of 20 cm in the southwest corner of A31-10. It is characterized by an arc shaped gray soil area adjacent to a reddish yellow sandy loam. The gray soil compeltely covered Square A31-2 at a comparable depth. Although first thought to be a pit orifice, excavations revealed that the gray soil sloped gradually to a maximum depth of 24 cm. The shallow depth suggests a natural undulation in Stratum IV (reddish yellow Stratum) which is overlain by Stratum II (gray brown loam).

Feature 78-4

This anomaly appeared as a rock concentration on the north slope in A54-12 and A54-20 at a depth of 19-25 cm. The surrounding deposit contained gravels of varying size within the upper portion of Stratum III. The majority of cobbles were confined to an area measuring 126 cm north-south by 86 cm east-west. Most of the rocks are not cracked or limited to a few select types. The size of rocks are not well sorted, but fall within the upper range of gravel size occurring in this portion of the site. As such, the rock "concentration" is believed to be merely a product of excavation. The smaller gravels may have been removed while the larger rocks were left in place.

SOUTH TERRACE FEATURES

Features in the south area of the site include three horizontal rock concentrations, one rock filled animal burrow, and two structures.

Horizontal Rock Concentrations

Feature 78-11 (Fig. 38)

This feature is an extensive concentration of densely packed rocks. Most are located in B5-25, and the north half of B6-21 and 6-22 at a depth of 24-38 cm in the upper portion of Stratum III. A few rocks found in the west half of B4-14 at the same depth and in a similar stratigraphic situation may be related. The angular rocks are piled four and five deep in Square B5-25, but are only lightly scattered across B4-14. The horizontal extent of the feature is uncertain. The rocks consist of a variety of lithic types but are primarily sandstone, siltstone, and occasionally quartzite. Many show fissures and cortex color alteration from burning. These rocks range from 4-10 cm in diameter, and may be in a primary depositional context. Two manos and a large biface were associated with the feature in B5-25.

Feature 78-14 (Fig. 38)

This feature is a small concentration of rocks located in B35-12 and B35-13 at a depth of 15-20 cm. The features measure 39 cm northeast by southwest and 30 cm southeast by northwest. The rocks are within an ashy brown loam matrix above the roof fall of Structure 1. They are small (3.5-7 cm) angular and tabular nodules of sandstone, siltstone, and occasional pieces of quartzite. Many are gray, orange or yellow which may reflect firing. No small thermal spalls were noted. Occasional charcoal flecks were near the rocks, but similar flecks occur throughout the ashy matrix. The feature may represent a secondary deposit.

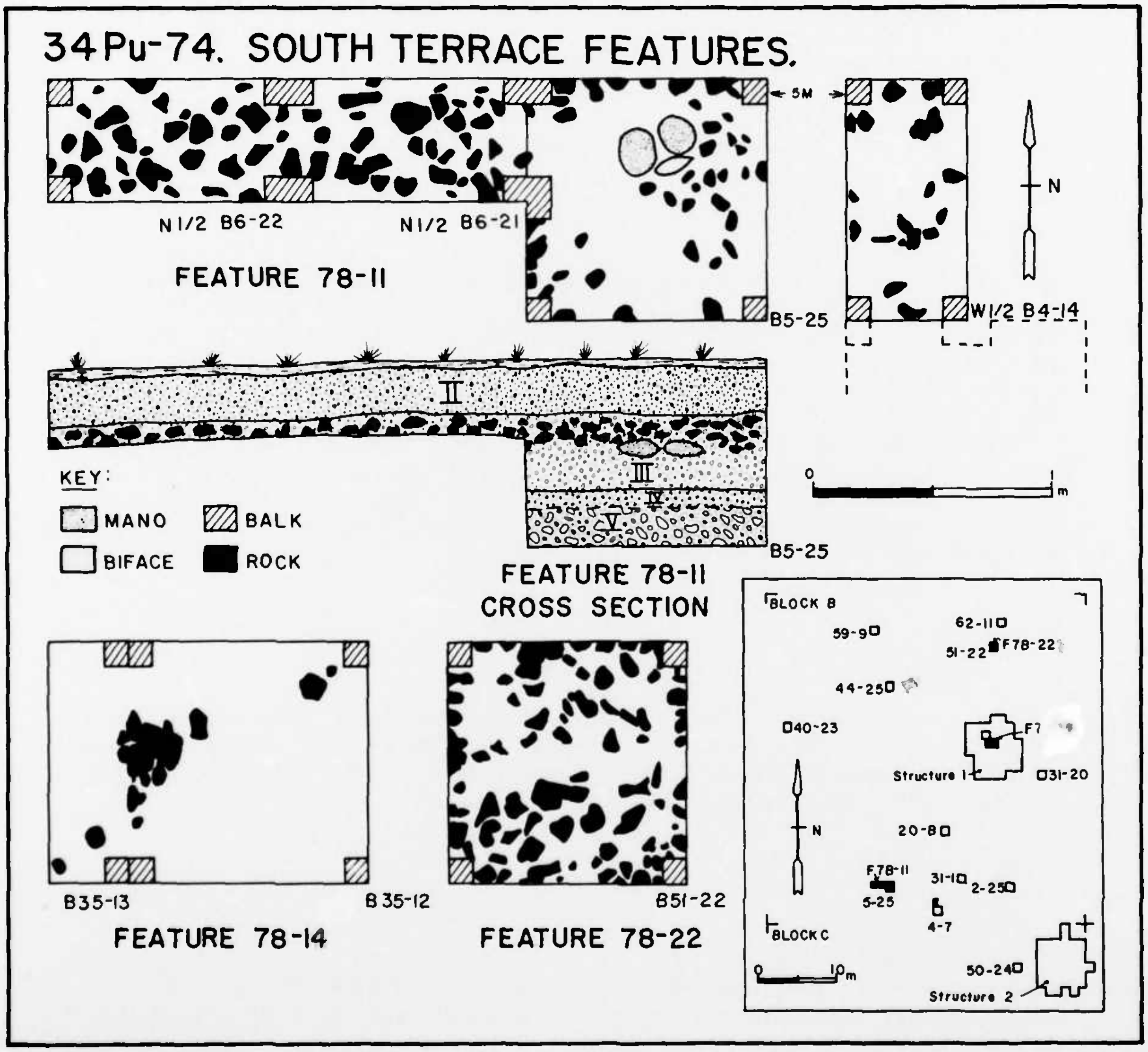


Fig. 38. Plan and profile view of South Terrace Area Features at the Blessingame site (34Pu-74).

Feature 78-22 (Fig. 38)

This feature is a dense concentration of angular rocks found in B51-22 at a depth of 18-30 cm within the lower portion of Stratum II. A few scattered rocks located 3 m north in B62-11 at a similar depth may be part of the same feature. The horizontal extent of the feature is unknown. Most of the rocks are angular nodules of sandstone, siltstone, and occasionally quartzite. Many are orange to gray in color, but no charcoal flecks were observed in the surrounding matrix.

Rock Filled Animal Burrow

Feature 78-23 (Fig. 38)

This feature consists of a cluster of large rocks packed in a recent animal burrow in B35-23. No rocks were visable prior to excavation, but the overlying fill was loose and a noticeable surface depression indicated the presence of a burrow. The rocks were 16-32 cm deep within an area 60 cm north-south by 80 cm east-west. The burrow became a hollow cavity below the rocks and turned southeast disturbing portions of the floor in Structure 1. All of the rocks within the burrow are large, and one is a slab metate. Feature 78-23 is interpreted as a large animal burrow recently sealed by the landowner. The slab metate near the house floor in this instance is a fortuitous association. A fence staple in the fill above the rocks indicate the historical affiliation of this feature.

STRUCTURES

A series of related features comprising structures were defined in two areas of the south terrace. Once the structures were recognized, only features examined in detail were assigned numbers. The following description considers each structure as a separate unit.

Structure 1

Structure 1 (Figs. 39; 40b) is in sub-blocks B30, 31, 34, 35. Neither the floor nor wall was completely excavated due to time limitations. A subrectangular structure measuring 5.85 m north-south by 4.60 m east-west with a long axis oriented approximately N 12°W was defined by ash, daub, and charcoal above the floor.

Features 78-5 and 78-7 (Wall and roof fall debris)

The composition of wall and roof fall debris was not uniform throughout Structure 1. Abundant charred cane, burned posts, ash, flecks of charcoal,

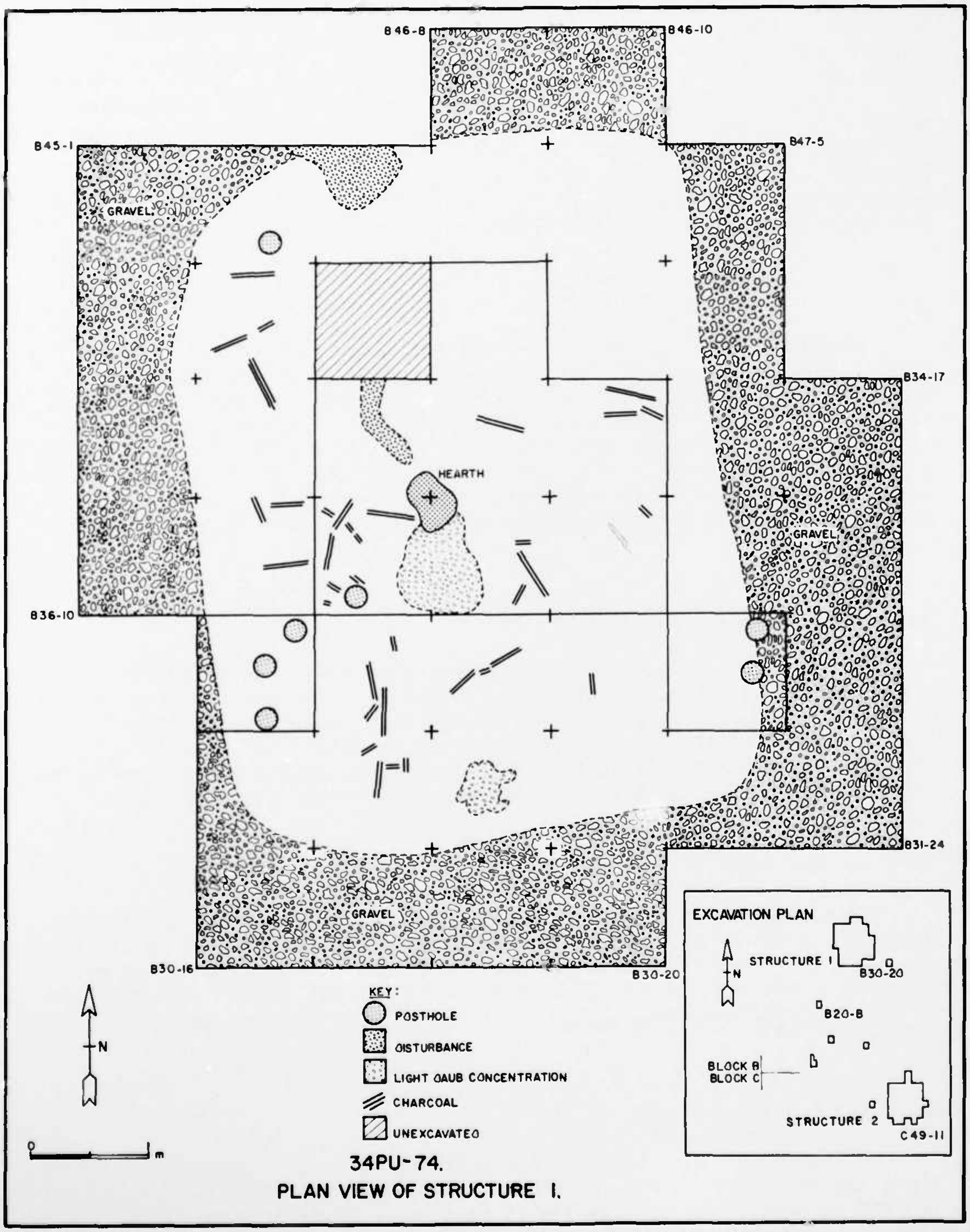


Fig. 39. Plan view of Structure 1 at the Blessingame site (34Pu-74).

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THE PREHISTORY OF THE PROPOSED CLAYTON LAKE AREA, SOUTHEAST OKL--ETC(U)
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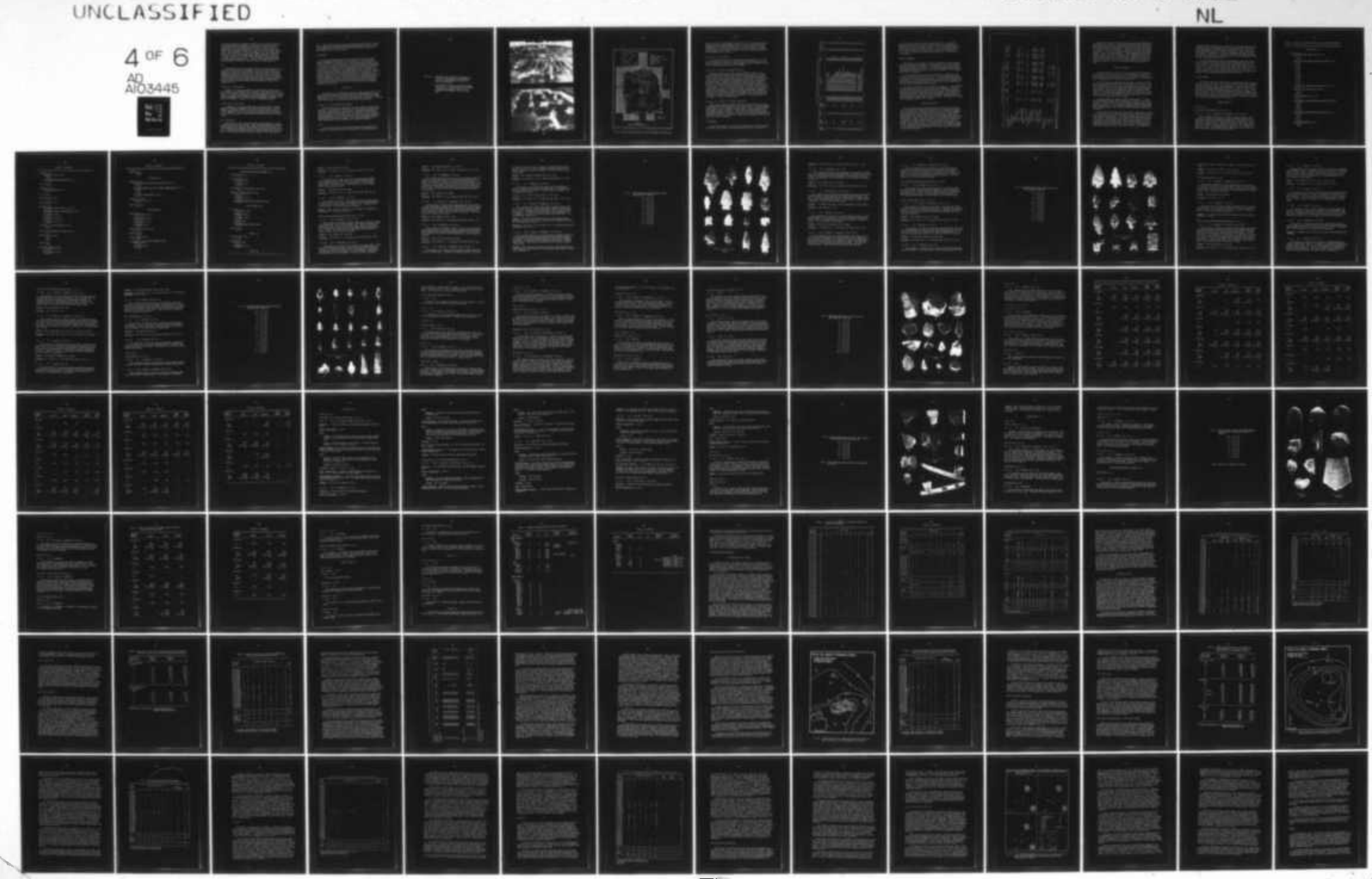

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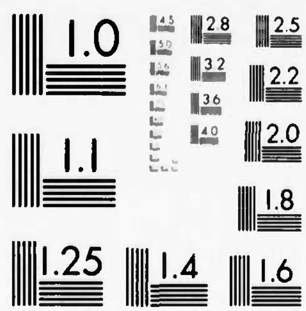


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

and a small quantity of daub were observed 27-33 cm below ground surface in squares defining the perimeter of the structure. Near the center a dense concentration of daub pellets occurred at a depth of 36-40 cm. Beneath this at a depth of 40-45 cm was a layer of charred cane, wood posts, ash, and charcoal stained soil. None of the daub specimens showed post or reed impressions. The uncorrected results of four radiocarbon dates from two charred post and one cane sample collected from the roof fall layer are A.D. 1765 ±60 (UGa-2532), 1060 ±65 (UGa-2721), 940 ±50 (Tx-3280) and 1420 ±50 (Tx-3283). The latter date is from cane, which provides an uncorrected date of A.D. 1190 (Tx-3283) when the recommended cane adjustment is applied (S. Valastro personal communications).

Floor

Although the structure had burned, the floor surface was unfired. The floor was relatively level, but gradually rose 3 cm in the middle of the structure to a centrally located hearth. Color and textural differences between the charred roof and wall fall layer and the floor surface were subtle near the center of the structure. The floor surface was defined by a few chert flakes (two to six per square), but more often it was considered to be a gray loam layer containing ash and charcoal flecks beneath a zone of cane and large charred posts above the gravelly Stratum III at a depth of 47 cm.

Feature 78-15 (Clay Hearth)

Portions of a centrally located clay lined hearth occurred 39-41 cm below surface in the northwest corner of B35-9. The hearth rim was missing and only an irregularly shaped part of the base, measuring 25 cm by 28 cm was found. The original hearth shape could not be determined. Eleven oriented baked clay specimens were submitted to the Archaeomagnetic Laboratory, University of Oklahoma. A date of A.D. 1200 (O.U.-1648) was obtained.

Interior Roof Support Pattern

The pattern of roof support posts was not discerned from the limited amount of excavation conducted in the center of the structure. A single postmold was exposed in the floor surface of B35-8 at a depth of 50 cm. It has a diameter of 20 cm and extends to an unknown depth. One postmold in the southwest quadrant of the structure may possibly reflect a four post pattern.

Wall Construction

Squares B34-5 and 35-4 were the only two excavated below floor level along the periphery of the structure. Wall support postmolds were observed in both squares along the ash limits ranging in depth from 50-95 cm. The five postmolds have a diameter of 10-12 cm and are spaced at 25-30 cm intervals. A vertically set burned post was also found in B35-24 at a depth of 28 cm. This post may be part of the wall, although it was inside the ash

limit. The nature and location of the entryway was not determined. Burned clay or daub was infrequently encountered along the periphery of the structure except in B30-22 near the south end of the structure. None of the daub showed cane or stick impressions.

Stratigraphy

As previously mentioned, the wall and roof fall layer consisted of daub and abundant charcoal within a zone located 36-45 cm deep at the center of the mound. Above this was a 28 cm thick layer of ash and flecks of fine charcoal. Rock concentration 78-14 occurred within the ashy layer. Although the ash deposition clearly occurred after the burning of Structure 1, its limits correspond closely in shape and size with the structure. Soils adjacent to Structure 1 contained abundant gravel. Possibly a low earthen berm was built against the wooden walls of the structure. Evidence for the earthen berm or bank is based on the low structural mound, the density of gravelly soil surrounding the structure, the distinct gravel-ash boundary found above the roof fall yet correlating to the perimeter posts, and the abundance of flakes oriented perpendicular to the ground surface within the gravel deposits which are indicative of rapid earth loading. The depression left from the collapse of the burned structure presumably had been filled with ash.

Structure 2

This structure is in sub-blocks C49, 50, 63 and 64 (Figs. 40a;41). Ash, daub, burned floor surface, and posts indicated a subrectangular structure measuring 5.85 m north-south by 4.95 m east-west with a long axis oriented approximately N 12.5° W. The east and west walls were not parallel. The south end of the structure is approximately 70 cm wider than the north.

Feature 78-12 (Wall and roof fall debris)

The composition of wall and roof fall in this structure differed from Structure 1. In comparison, relatively little charcoal was found and most came from peripheral areas of the structure. More daub was recovered in the north end and along the central axis of Structure 2. None of these specimens had cane or stick impressions. The wall and roof fall materials occurred between 16 cm and 22 cm below surface. Three radiocarbon dates have been obtained from two charred posts. The uncorrected results are A.D. 1385 ±60 (UGa-2533), 1160 ±65 (UGa-2720), and 950 ±50 (Tx-3281).

Floor

A fired floor surface 2 cm thick was uncovered at the north end of Structure 2 in C64-8, 64-9, 64-12, 64-13 and 64-14. Oriented baked clay

Fig. 40. a: Relationship of Structure 2 (foreground) to Structure 1 (background) in South Terrace Area of the Blessingame site (34Pu-74). View is to the north.

b: South half of Structure 1 at the Blessingame site (34Pu-74). Note charred posts, postholes (foreground), and gravel matrix outside structure (right center). View is to the east.

a

b

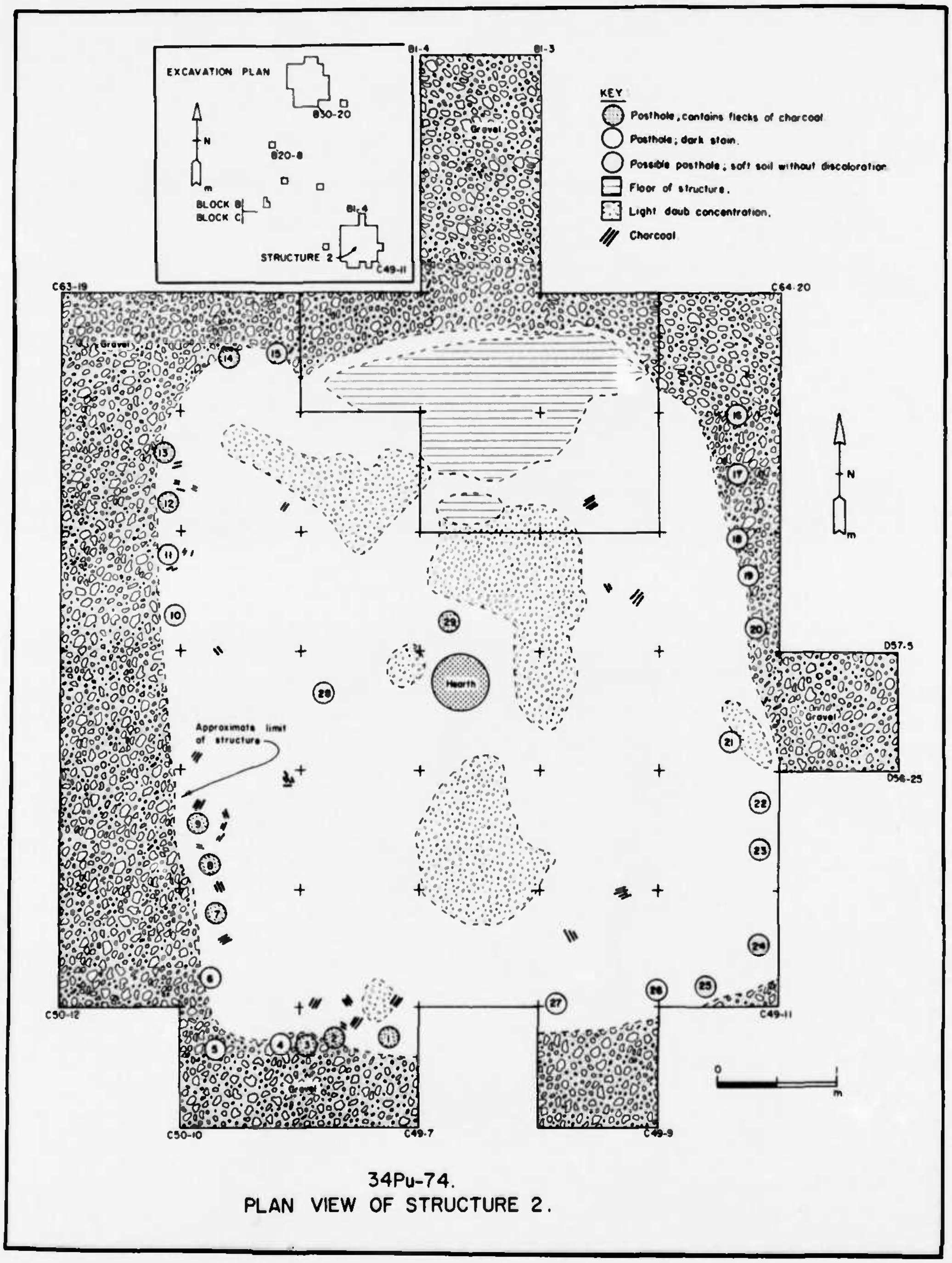


Fig. 41. Plan view of Structure 2 at the Blessingame site (34Pu-74).

samples provided an archaeomagnetic date of A.D. 1185 ±18 years (O.U.-1647). The rest of the structure showed no distinct color or textual differences between the floor surface and overlying fill. An analytical floor level consisting of fill with occasional daub and charcoal flecks was followed in the southern portion of the structure. The floor surface was relatively level throughout the structure.

Feature 78-13 (Clay Hearth)

A clay hearth was centrally located within the structure. A low, oval clay rim measuring 54 cm by 62 cm was built on the level floor surface. No ash was found within the hearth. Archaeomagnetic samples collected from the hearth provided a date of A.D. 1070 (O.U.-1646).

Feature 78-16 (Interior roof support pattern)

Postmold patterns in Structure 2 were difficult to define. Most postmolds were not recognized until they penetrated Stratum IV at a depth of 40 cm (28 cm below the structure floor). A few postmolds contained flecks or charcoal or slightly darker soil colors, but most were identified on the basis of differential soil compactness (Table 46). Soft areas in the gravel deposit (Stratum IV) occurring at regular intervals along the perimeter of the structure were considered to be postmolds. However, similar soft areas near the center of the structure could not be designated as confidently. The interior postmold pattern is unclear. None of the interior "soft areas" or "charcoal stain areas" conformed to a quadrilateral or bilateral configuration. Several soft areas were randomly scattered within the structure and two containing charcoal flecks were located north and west of the central hearth area. The postmold west of the hearth was excavated as a sample of interior posts (F78-16). It was vertically set to a depth of 71 cm (49 cm below floor).

Features 78-17 through 78-21 (Wall construction)

Many of the suspected postmolds observed at a depth of 40 cm could be correlated with pieces of charcoal on the floor surface. The wall postmolds ranged from 9-14 cm in diameter and were spaced at 30-55 cm intervals along the perimeter of the structure. No clear gaps in the pattern were found which might indicate an entrance. Five of the 27 recognizable wall postmolds were excavated as a sample. All were vertically set to depths ranging from 53-85 cm (31-63 cm below floor). Daub was not common near the east and west walls of this structure.

Stratigraphy

A thin (8 cm) layer of gray brown ashy loam was over the wall and roof fall matrix in Structure 2. Unlike the thick ashy layer in Structure 1,

Table 46. Description and location of postmolds in Structure 2 at 34Pu-74

Post Mold No.	Feature Number	Oiameter	Depth Below Floor	Shape	Description	Square	Oistance (cm)	
							South	East
1	F78-17	14	49.5	Circular	Dark stain, flecks of charcoal.	C49-7	76	26
2		11		Circular	Oark stain, flecks of charcoal.	C49-7	73	69
3		9		Irregular	Charcoal and daub.	C49-7	68	97
4		11		Circular	Dark stain, no charcoal.	C49-7	72	16
5		15		Circular	Oark stain, no charcoal.	C49-6	68	72
6		13		Circular	Dark stain, no charcoal.	C49-15	23	73
7	F78-21	10	60.0	Irregular?	No stain, flecks of charcoal.	C49-15	80	70
8		12		Circular	Dark stain, flecks of charcoal.	C49-16	18	75
9		12		Circular	Dark stain, flecks of charcoal.	C49-16	58	88
10		12		Unknown	Soft soil, no stain or charcoal.	C63-1	30	5
11		13		Circular	Oark, soft stain, flecks of charcoal.	C63-1	76	10
12		12		Circular	Dark stain, flecks of charcoal.	C63-10	25	10
13		13		Circular	Dark stain, flecks of charcoal.	C63-10	63	12
14	F78-18	10	52.0	Irregular?	Soft soil, flecks of charcoal, no stain.	C64-15	45	60
15		12		Irregular	Soft soil, stain, no charcoal.	C64-15	50	20
16	F78-20	12	40.5	Circular	Soft soil, no stain or charcoal.	C64-10	90	33
17		12		Circular	Soft soil, no stain or charcoal.	C64-10	50	35
18		12		Irregular	Soft soil, no stain or charcoal.	C64-1	96	35
19		10		Circular	Soft soil, no stain or charcoal.	C64-1	64	23
20		12		Circular	Soft soil, no stain or charcoal.	C64-1	18	22
21	F78-19	13	24.5	Circular	Oark stain, flecks of charcoal.	C49-21	24	38
22		12		Circular	Oark stain, flecks of charcoal.	C49-20	75	16
23		12		Circular	Soft dark stain, no charcoal.	C49-20	35	12
24		10		Circular	Soft soil, no stain or charcoal.	C49-11	52	17
25		--		Circular		C49-11	22	62
26		10		Circular	Soft, dark stain, no charcoal.	C49-12	18	0
27		10		Circular	Soft dark stain, no charcoal.	C49-12	5	85
28	F78-16	12	46.0	Circular	Soft dark ashy stain, no charcoal.	C49-24	80	12
29		12		Irregular	Soft soil, flecks of charcoal, no stain.	C64-3	25	78

this layer generally did not contain charcoal flecks. It is uncertain whether the ash layer represents a depositional episode separate and distinct from the burning of the structure. The soil immediately adjacent to Structure 2 contained abundant gravels. Most flakes observed within the gravelly unit were vertically oriented, suggesting a redeposition of soil. A low earthen berm or bank built against the walls of Structure 2 is suspected.

ABSOLUTE CHRONOLOGY

Radiocarbon and archaeomagnetic dating techniques were used to determine the age of specific features. A single date of A.D. 1730 ±100 (UGa-1518) was reported from Feature 76-1 in the north terrace mound during the testing phase (Bobalik 1977: 496). This sample was thought to have been contaminated with recent materials since the associated artifacts suggested a much earlier occupation.

Ten radiocarbon samples and three archaeomagnetic samples were submitted for analysis during 1978 (Table 47). Since archaeomagnetic dates are derived from master curves crosschecked by associated dendrochronological samples, all radiocarbon dates have been corrected using the MASCA calibration (Ralph, Michael, and Han 1973). This permits direct comparison of results from the different dating techniques.

The results from 34Pu-74 are not easy to interpret. In some instances, the dated sequence conflicts with the observed stratigraphy. In other cases multiple dates from the same feature yield significantly different results, even when considering the two sigma interval. The correlation of radiocarbon dates with established tree ring calibration curves has not significantly helped in reducing these discrepancies (Ralph, Michael, and Han 1973; Damon, Ferguson, Long, and Wallick 1974). An elaboration of these dating problems from 34Pu-74 is in order.

North Terrace Dates

Four radiocarbon dates are available from three features within the north terrace mound. Features 78-6 and 78-9 are rock hearths of similar size and content and stratigraphically appear to be relatively contemporaneous as the most recent cultural features on the mound. Both hearths have been dug into Stratum I and were 5-25 cm below the ground surface. Feature 78-9 is part of the same feature (76-1) exposed during the earlier testing phase. Despite their similarities, the two MASCA corrected dates for Feature 78-9 have a midpoint spread of 235 years, and the date for Feature 78-6 is 1335 years earlier than Feature 78-9 which occurs in a similar stratigraphic position. To further confuse the situation, Feature 78-10 (a horizontal rock concentration) which is in the middle of Stratum II and stratigraphically below Feature 78-6 yielded the most recent date for the north mound area.

Table 47. Summary of radiocarbon and archaeomagnetic dates from 34Pu-74.

Provenience	Material	Weight (grams)	Lab Number	Date BP	Uncorrected* 5568	Uncorrected* 5730	Corrected* MASCA	Corrected* Damon, et. al.
RADIOCARBON DATES:								
NORTH TERRACE MOUND								
Rock Hearths								
F7B-9, F76-1								
Square 2 (1976)	Wood	6.1	UGa-1518	220 ±100	1730 ±100	1725 ±100	1640 ±110	Suess
A21-1B, L. 2(10-20 cm)	Wood	12.9	Tx-3282	500 ±40	1450 ±40	1435 ±40	1405 ±50	1420 ±55
F78-6								
A20-14, L. 2(10-20 cm)	Wood	10.5	Tx-3284	1920 ±60	30 ±60	30 ±60 BC	60 ±70	20 ±70
Horizontal Rock Concentrations								
F7B-10								
A20-14, L. 3(20-30 cm)	Wood	9.0	UGa-2534	175 ±75	1775 ±75	1770 ±75	1660 ±85	Suess
SOUTH TERRACE AREA								
Structure 1 (Roof fall)								
B35-9 through B35-12	Cane	25.0	Tx-3283**	530 ±50	1420 ±50	1405 ±50	1390 ±60	1390 ±60
B35-17, L. 3(20-30 cm)	Wood	87.0	Tx-3280 UGa-2721	1010 ±50 890 ±65	940 ±50 1060 ±65	910 ±50 1035 ±65	970 ±60 1075 ±75	950 ±70 1065 ±70
B34-15, L. 3(20-30 cm)	Wood	50.0	UGa-2532	185 ±60	1765 ±60	1760 ±60	1650 ±70	Suess
Structure 2 (Roof fall)								
C64-2, L. 2(10-20 cm)	Wood	77.0	UGa-2533	565 ±60	1385 ±60	1370 ±60	1370 ±70	1365 ±70
C64-11, L. 2(10-20 cm)	Wood	100.2	UGa-2720 Tx-3281	790 ±65 1000 ±50	1160 ±65 950 ±50	1135 ±65 920 ±50	1190 ±75 980 ±60	1160 ±70 965 ±70
ARCHAEOMAGNETIC DATES:								
Structure 1								
B35-9	Hearth		OU-1648	A.D. 1200	alpha 3.1			
Structure 2								
C64-13	Floor		OU-1647	A.D. 1185	alpha 1.8			
C49-23	Hearth		OU-1646	A.D. 1070	alpha 4.0			

*All dates reported A.D. unless otherwise indicated.
**Cane date. The B.P. date for this sample can be adjusted from 530 ±50 to 760 ±50 (S. Valastro personal communication).

Recent brush clearing and burning operations may have contaminated sample UGa-1518. However, it seems unlikely that surface burning would have altered sample UGa-2534 associated with the horizontal rock feature 30 cm below surface or caused sample Tx-3284 from the other rock hearth to yield a date 1335 years too early. The source of these discrepancies is uncertain. Some of the dating discrepancy may be due to small sample sizes (6.1g to 12.9 g) and the amount of rootlets permeating the carbon samples. Despite pretreatment efforts, recent contamination may have affected some of the dates. Although sample Tx-3282 most closely coincides with the expected date of the artifact assemblage from the upper portion of the mound, all four dates from the north terrace mound are considered suspicious in lieu of additional supporting chronometric data.

South Terrace Dates

All dated materials from the south part of the site are directly associated with the two structures. One archaeomagnetic and four radiocarbon dates are available from Structure 1 and three radiocarbon and two archaeomagnetic dates are available from Structure 2. Unfortunately, major inconsistencies occur within each structure.

Four radiocarbon determinations were obtained from three separate wood and cane samples from the roof fall materials in Structure 1. The MASCA corrected dates for the separate wood samples range from A.D. 970 ±60 to 1650 ±70 and display no overlap even when the two sigma interval is considered. The grass/cane adjustment figure of 230 years added to sample Tx-3283 improves the clustering of dates from Structure 1 (see Table 47). The single archaeomagnetic date of A.D. 1200 from the central hearth is within the total range of the radiocarbon dates, but is also outside the one sigma range of any one date.

A similar pattern is present for dates from Structure 2. Three radiocarbon determinations from two wood posts ranged from A.D. 980 ±60 to 1370 ±70 using the MASCA correction procedure. The one sigma intervals do not overlap. Two dates from the same pretreated sample yielded MASCA corrected dates of A.D. 980 ±60 (Tx-3281) and 1190 ±75 (UGa-2720). Archaeomagnetic dates of A.D. 1070 and 1185 were obtained from the same structure.

Interpretation of the absolute dates from the structures is not easy. It is difficult to accept an 810 year duration for the existence of Structure 1 and a 520 year span for Structure 2 (maximum range of one sigma value, MASCA corrected dates). The sources of the dating discrepancies is uncertain. All submitted carbon samples from the structures were of sufficient size (25 to 100.2 g) to reduce counting problems. This is supported by the small sigma values. Some variation within the carbon sequence may reflect the aboriginal reuse of posts, or the sampling of inner versus outer post rings. Even so, it seems unlikely that such a

discrepancy would span more than a century. Such an explanation cannot be applied to the post samples split and processed by different laboratories since the samples were pretreated at a single institution. Some of the more recent dates may be due to modern contamination. Most samples were permeated with fine rootlets. Despite pretreatment, some root contamination remains a possibility. The conflicting radiocarbon dates underscores the need for processing multiple samples and for cross checking the results by other independent dating methods.

The three independently derived archaeomagnetic dates range from A.D. 1070 to 1200 and are within the early span of radiocarbon dates from the same structures. These dates are consistent with dates attributed to similar artifact assemblages as those found within the structures including a *Graves Chapel* pipe, *Sanders* ceramic type, small point forms, and rectangular architectural styles (Hoffman 1967; Brown 1971, 1976: 243). Thus the structures are believed to be associated with the early Caddoan period, and were probably constructed between A.D. 940 and 1250.

CULTURAL REMAINS

This section describes 78,957 artifacts (chipped stone tools, debitage, ceramics, ground stone tools, and historic debris) and 88 floral and faunal specimens excavated in 1978. The organization of cultural remains follows the classification system outlined in Chapter 6. Specific class, group, category, and variety designations used in this chapter are listed in Table 48. Metric attributes of chipped and ground stone tools are summarized in Tables 49 and 50. The lithic source materials of selected finished chipped stone tools and a sample of lithic debris are presented in Tables 51 and 52. The horizontal and vertical distribution of cultural materials are discussed in the following section on intrasite analysis.

Chipped Stone *(01)*

POINTS (01-00)

Large Contracting Stemmed Points *(01-01-01)*

01-01-01A N=37: 12 Complete, 25 Fragmentary (Fig. 42 a-c)

These specimens have acute tips, broad to narrow triangular blades, straight to slightly convex edges, prominent to rounded shoulders, and stems which contract to a pointed or rounded base. The blades of 14% are relatively narrow and thick. The shoulders are the widest part of these specimens. However, 19% have asymmetrical shoulders. The contracting stems on 30% of the sample are narrow and taper to a point. None of the bases have cortex. All have biconvex or plano-convex cross sections and appear to be made from bifacially worked cobbles.

Table 48. Summary of artifact categories and varieties from 34Pu-74.

Chipped Stone *(01)*

POINTS (01-00)
- Large Contracting Stemmed Points *(01-01)*
  - *01-01A*
  - *01-01B*
  - *01-01C*
- Large Expanding Stemmed/Corner-Notched Points *(01-02)*
  - *01-02A*
  - *01-02B*
  - *01-02D*
  - *01-02E*
  - *01-02H*
  - *01-02I*
  - *01-02K*
  - *01-02L*
  - *01-02M*
  - *01-02N*
  - *01-02O*
  - *01-02P*
  - *01-02Q*
  - *01-02S*
- Large Expanding Stemmed/Side-Notched Points *(01-03)*
  - *01-03A*
- Large Straight Stemmed Points *(01-04)*
  - *01-04A*
  - *01-04C*
  - *01-04D*
- Large Unstemmed Points *(01-05)*
  - *01-05A*
  - *01-05C*
- Small Expanding Stemmed/Corner-Notched Points *(01-06)*
  - *01-06A*
  - *01-06B*
  - *01-06E*
  - *01-06F*
  - *01-06G*
  - *01-06H*
- Small Expanding Stemmed/Side-Notched Points *(01-07)*
  - *01-07A*
  - *01-07B*
  - *01-07C*
  - *01-07D*
  - *01-07E*
- Small Unstemmed Point *(01-08)*
  - *01-08B*
  - *01-08C*

Table 48. Continued

DRILLS (02-00)
- Shaped Base Drills *(02-01)*
  - *02-01B*
  - *02-01C*
- Drill Fragments and Segments *(02-03)*
  - *02-03A*

WEDGES (03-00)
- *03-01A*

SCRAPERS (05-00)
- Bifacial Scrapers *(05-01)*
  - *05-01A*

HOES (07-00)
- *07-01A*

TANGED BIFACES (08-00)
- *08-01A*

BACKED BIFACES (09-00)
- *09-01A*

BIFACES (10-00)
- Cobble/Quarried Block Biface I *(10-01)*
  - *10-01A*
- Cobble/Block Biface II/Thick Biface *(10-02)*
  - *10-02A*
- Thin Biface I *(10-03)*
  - *10-03A*
- Thin Biface IIa *(10-04)*
  - *10-04A*
- Thin Biface IIb *(10-05)*
  - *10-05A*

MISCELLANEOUS BIFACE IMPLEMENTS (11-00)
- *11-01A*
- *11-02A*

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)
- *12-01A*

MODIFIED FLAKES (13-00)
- *13-01A*
- *13-02B*
- *13-01C*

CORES (14-00)
- *14-01A*

SPLIT/TESTED COBBLES (15-00)
- Split Cobbles *(15-01)*
  - *15-01A*
- Tested Cobbles *(15-02)*
  - *15-02A*

Table 48. Continued

DEBITAGE (16-00)
16-01A
16-02A

Fired Clay *(02)*

CERAMICS (01-00)
Plain Grog, Grit, and Bone Tempered Wares *(01-01)*
01-01A
01-01D
Decorated/Slipped Grog, Grit, and Bone Tempered Wares *(01-02)*
01-02A
01-02B
01-02C
Plain Shell Tempered Wares *(01-03)*
01-03A

CERAMIC PIPE (02-00)
Red River Pipe *(02-01)*
02-01A

BAKED CLAY (03-00)
03-01A

Ground Stone *(03)*

MANOS (01-00)
Unifacial Manos *(01-01)*
01-01A
Bifacial Manos *(01-02)*
01-02A
Faceted Manos *(01-03)*
01-03A
Pitted Manos *(01-04)*
01-04A

METATES/GRINDING SLABS (02-00)
02-01A

ABRADERS (03-00)
03-01A

GROUND HEMATITE (04-00)
04-01A

MISCELLANEOUS GROUND STONE IMPLEMENTS (06-00)
Pallets *(06-01)*
06-01A
Mano Blanks *(06-02)*
06-02A

Table 48. Continued

Pecked/Battered/Unmodified Cobbles *(04)*

HAMMERSTONES (01-00)
01-01A

PITTED STONES (02-00)
Unifacial *(02-01)*
02-01A
Bifacial *(02-02)*
02-02A

MISCELLANEOUS PECKED/BATTERED STONE (03-00)
03-01A

UNMODIFIED COBBLES/PEBBLES (04-00)
Fossils *(04-02)*
04-02A
Concretions *(04-03)*
04-03A
Unmodified Nodules-Special Context *(04-04)*
04-04A

Historic Debris *(07)*

METAL (03-00)
Fence Staples *(03-04)*
03-04A
Barbed Wire *(03-05)*
03-05A
Cartridges *(03-06)*
03-06A
Buckles *(03-08)*
03-08A
Miscellaneous Metal Items *(03-09)*
03-09A

PLASTIC (04-00)
04-01A

Faunal *(08)*

BONE/HORN/TEETH (01-00)
01-01A

SHELL (02-00)
Molluscs *(02-01)*
02-01A
Gastropods *(02-02)*
02-02A

Floral *(09)*

Comments: They resemble the *Gary* type.

References: Bell 1958: 28, Pl. 14; Suhm and Jelks 1962: 197, Pl. 99.

01-01-01B N=1: 1 Complete (Fig. 42 d)

This specimen has an acute tip, broad triangular blade, asymmetrically straight and convex blade edges, one weakly developed and one slightly barbed shoulder, and a stem which tapers to a finely worked concave base. The shoulder area is the widest part of this specimen. It has a biconvex cross section.

Comments: It resembles the *Langtry* type.

References: Bell 1958: 38, Pl. 19; Suhm and Jelks 1962: 205, Pl. 103.

01-01-01C N=2: 2 Fragmentary (Fig. 42 e)

These specimens are small, finely worked points with a thin, narrow triangular blade, slightly convex blade edges, mildly developed shoulders. The stem is contracting and bases are rounded to flat. Maximum width is at the shoulders. The cross sections are biconvex.

Comments: They resemble *Gary* points, but are smaller, more symmetrical, and display fine, even edge alteration.

Large Expanding Stemmed/Corner-Notched Points *(01-01-02)*

01-01-02A N=4: 4 Fragmentary (Fig. 42 f-g)

These specimens have broad triangular blades with straight to slightly convex blade edges, well defined shoulders, and slightly expanding or parallel broad stems. Bases may be slightly convex, concave, or straight. The shoulders are the widest part of these points and are strongly developed. The tangs are sharply defined. Stem edges on one specimen are heavily ground. Cross sections are biconvex.

Comments: They resemble the *Lange* type.

References: Bell 1958: 36, Pl. 18; Suhm and Jelks 1962: 203, Pl. 102.

01-01-02B N=2: 2 Fragmentary (Fig. 42 h)

These points have broad triangular blades with straight edges. Shoulders are pronounced and rounded. The notches are wide and shallow and produce only a moderately expanding stem. Maximum width is attained at the shoulders, but one specimen has an equally wide base. The bases are straight and the tangs are rounded. The cross sections are biconvex.

Comments: These specimens resemble *Ensor* points.

References: Bell 1960: 34, Pl. 17; Suhm and Jelks 1962: 189, Pl. 95.

01-01-02D N=11: 11 Fragmentary (Fig. 42)

These specimens have relatively short, broad triangular blades with straight to convex blade edges. The shoulders are prominent but not barbed. The notches are relatively broad and produce a moderately expanding base. The stems are often as wide as the shoulder areas. Basal tangs are rounded and blunt and the base has a broad notch producing a concave area. These points are thick and have a biconvex cross section. All are broken and some show extensive distal battering and numerous step fractures.

Comments: They resemble the *Frio* type.

References: Bell 1960: 48, Pl. 24; Suhm and Jelks 1962: 195, Pl. 98.

01-01-02E N=4: 2 Complete, 2 Fragmentary (Fig. 42 j-k)

These specimens have short, broad triangular blades with straight to convex blade edges, prominent non-barbed shoulders, and broad notches producing a moderately expanding stem. The tangs are rounded to angular and the bases are straight. Bases are often as wide as the shoulder areas, although one specimen has a relatively narrow base. These specimens have a biconvex cross section.

Comments: They resemble the *Trinity* type.

References: Bell 1958: 96, Pl. 48; Suhm and Jelks 1962: 253, Pl. 127.

01-01-02H N=2: 2 Fragmentary (Fig. 42 b)

These specimens have triangular blades. They are characterized by narrow notches deeply cut into the corners producing short, well defined barbed shoulders and a moderately expanding wide stem. The stem meets the straight to convex base at a well defined tang. Cross sections are biconvex.

Comments: They are similar to the *Marcos* type.

References: Bell 1958: 42, Pl. 21; Suhm and Jelks 1962: 209, Pl. 105.

01-01-02I N=3: 2 Complete, 1 Fragmentary (Fig. 43 a-b)

All specimens in this variety have triangular to ovate blades with straight to convex edges. Shoulders are prominently barbed. The barbs

are nearly as long as the stem. Notches are deep and on two specimens are relatively narrow. Stems are moderately expanding and bases are convex. Both barbs and tangs are rounded. Cross sections are irregularly biconvex.

Comments: These specimens resemble the *Marshall* type.

References: Bell 1958: 44, Pl. 22, Suhm and Jelks 1962: 211, Pl. 106.

01-01-02K N=1: 1 Fragmentary (Fig. 42 m)

This specimen has a broad blade with well defined shoulders, a moderately expanding wide stem, and a concave base. The shoulders are the widest portion of this point. The basal tangs are rounded. The cross section is biconvex.

Comments: This specimen resembles the *Martindale* type.

References: Bell 1960: 70, Pl. 35; Suhm and Jelks 1962: 213, Pl. 107.

01-01-02L N=8: 3 Complete, 5 Fragmentary (Fig. 42 n)

These specimens have short broad triangular blades with relatively blunt tips and straight to convex blade edges. Notches are broad but shallow and the shoulder areas are not well defined. Tangs are rounded to subangular. The bases are slightly concave. Maximum width is at the shoulders. The cross sections are biconvex and plano-convex. Two specimens have reworked tips.

Comments: These specimens resemble the *Fairland* and *Edgewood* types. They are distinguished from *01-01-02D* points by less pronounced shoulders and a shallower basal concavity.

References: Bell 1958: 20, Pl. 10; 1960: 38, Pl. 19; Suhm and Jelks 1962: 191, Pl. 96; 183, Pl. 92.

01-01-02M N=4: 2 Complete, 2 Fragmentary (Fig. 42 o-p)

These specimens have long, relatively narrow, triangular blades with straight edges and weakly developed shoulders formed by broad notches. The stems are mildly to moderately expanding and the tangs are rounded to pointed. The shoulders are the widest part of the point. Bases are deeply concave. These points are relatively thick and have a biconvex cross section.

Comments: These specimens resemble the *Darl* type. They differ from *01-01-02D* points by longer blades, less pronounced expanding stems and deeper basal concavities.

Fig. 42. Selected chipped stone artifacts from the Blessingame site (34Pu-74).

a-c: *01-01-01A*

d: *01-01-01B*

e: *01-01-01C*

f-g: *01-01-02A*

h: *01-01-02B*

i: *01-01-02D*

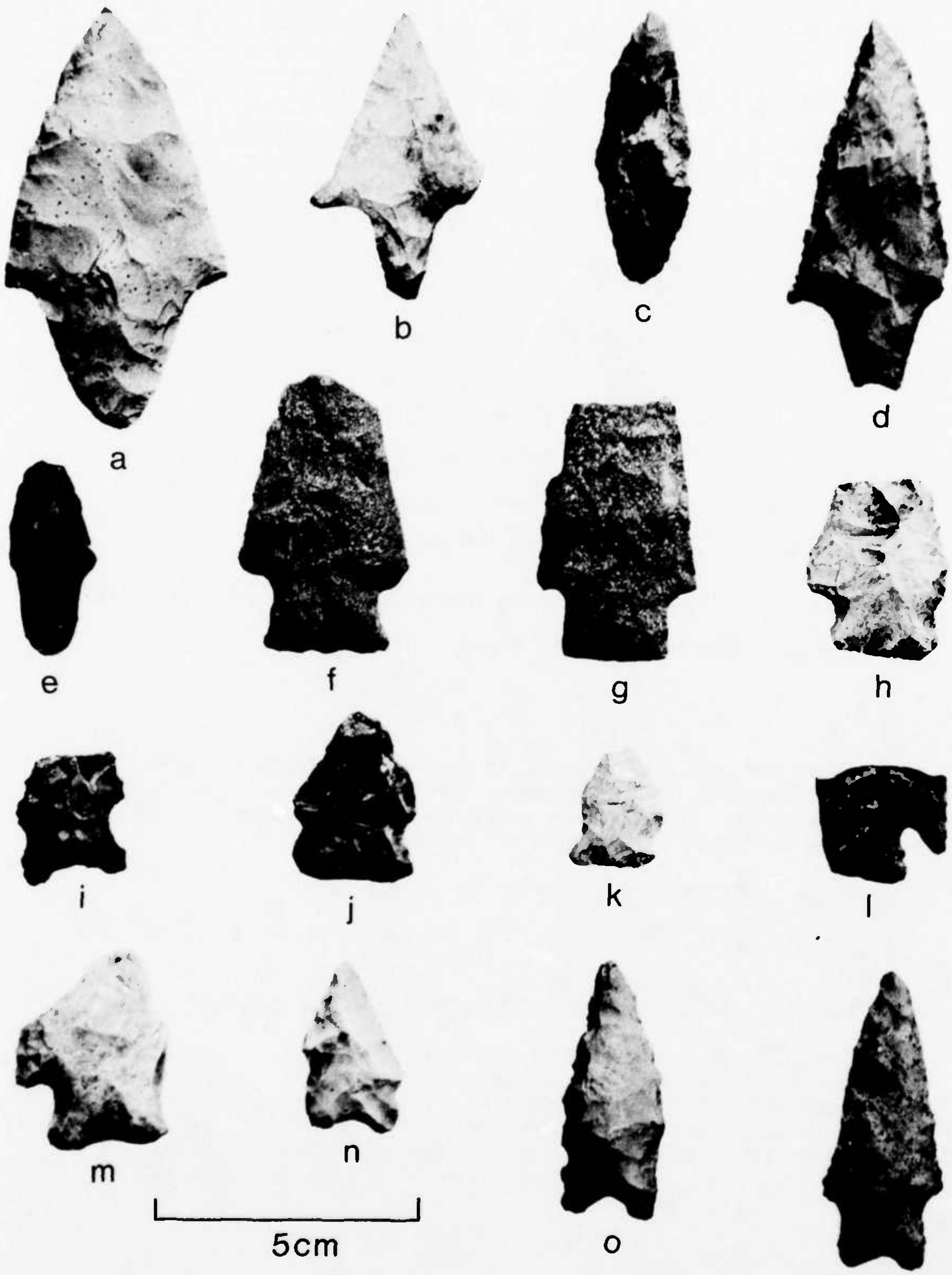
j-k: *01-01-02E*

l: *01-01-02H*

m: *01-01-02K*

n: *01-01-02L*

o-p: *01-01-02M*


a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
5cm

References: Bell 1960: 26, Pl. 13; Suhm and Jelks 1962: 179, Pl. 90.

01-01-02N N=2: 2 Fragmentary (Fig. 43 c)

These specimens have broad triangular blades with irregularly straight edges. The shoulders are short with rounded barbs formed by narrow notches. The stems are moderately expanding and meet the convex base at rounded corners. Maximum width is at the shoulders. Cross sections are irregularly biconvex.

Comments: They resemble the *Williams* type.

References: Bell 1960: 96, Pl. 48; Suhm and Jelks 1962: 259, Pl. 130.

01-01-02O N=1: 1 Reworked Point (Fig. 43 d)

This specimen has a very broad ovate blade with irregular convex edges. Shoulders have well defined barbs left from narrow corner notches. The stem is strongly expanding and meets the straight base in rounded corners. Flake scars on both faces are irregular. The tip edge is sinuous and may be reworked. It has a biplano cross section.

Comments: It resembles the *Snyder* type but the notches are quite narrow.

References: Bell 1958: 88, Pl. 44.

01-01-02P N=1: 1 Complete (Fig. 43 e)

This specimen has an acute tip on a short triangular blade, less well defined shoulders, and a stem which initially contracts then abruptly becomes parallel. The shoulders and tangs are well rounded. The base is convex. The cross section is plano-convex.

Comments: This specimen resembles the *Travis* type.

References: Bell 1958: 94, Pl. 47; Suhm and Jelks 1962: 251, Pl. 126.

01-01-02Q N=4: 1 Complete, 3 Fragmentary (Fig. 43 f-g)

These specimens have large triangular blades, convex edges, and well defined non-barbed shoulders. The complete specimen has a rounded tip. The shoulders are the widest part of the point. The corner notches may be broad to narrow and the stems are moderately expanding. Both shoulders and tangs are relatively well defined but not pointed. The bases are slightly concave. These specimens have biconvex cross sections.

01-01-02S N=3: 2 Reworked, 1 Fragmentary (Fig. 43 h)

The tip and blade shape of these specimens cannot be determined. They have broad blades with weakly defined shoulders, broad shallow notches, and a slightly expanding stem. The base may be as wide as the shoulders. Tangs are sharply defined and the bases may be slightly concave. Two specimens have extensively reworked blade areas. The weak shoulders may reflect extensive reshaping.

Large Expanding Stemmed/Side-Notched Points *(01-01-03)*

01-01-03A N=1: 1 Fragmentary (Fig. 43 i)

This specimen has a long, wide triangular blade with convex edges and relatively well defined, non-barbed shoulders. The side notches are broad but shallow. The stem flares to rounded tangs and the incomplete base appears to be concave. The widest part of the point occurs at both the blade edges adjacent to the shoulders and at the basal tangs.

Large Straight Stemmed Points *(01-01-04)*

01-01-04A N=5: 3 Complete, 2 Fragmentary (Fig. 43 j-k)

These specimens are relatively small points with acute tips, broad triangular blades, and sharply defined shoulders. The stems are straight and meet the straight to slightly convex base in rounded but defined tangs. The stems constitute nearly half of the total point length. The cross sections are biconvex.

Comments: These resemble the *Carrollton* type.

References: Bell 1958: 12, Pl. 6; Suhm and Jelks 1962: 171, Pl. 86.

01-01-04C N=1: 1 Complete (Fig. 43 l)

This specimen has a relatively short, wide triangular blade with irregularly straight edges and sharply defined, long barbed shoulders. The stem is straight and meets the slightly convex base in rounded corners. The barbs are the widest part of the point. The cross section is biconvex.

Comments: This specimen resembles the *Shumla* type.

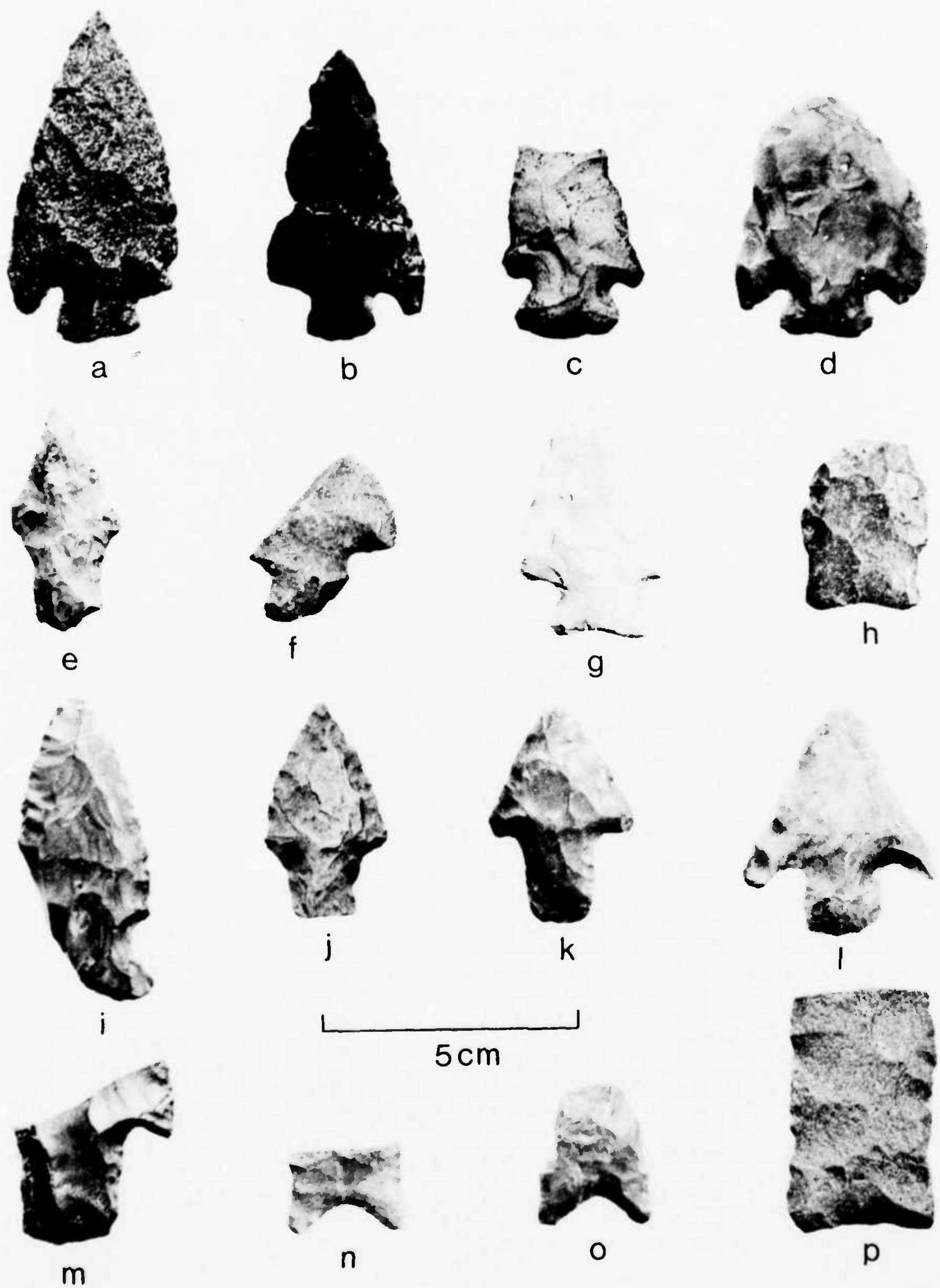
References: Bell 1960: 86, Pl. 43; Suhm and Jelks 1962: 247, Pl. 124.

01-01-04D N=1: 1 Fragmentary (Fig. 43 m)

This specimen is a large point with a broad blade and well developed, short pointed barbs. The stem section is wide and straight and meets the

Fig. 43. Selected chipped stone artifacts from the Blessingame site (34Pu-74).

a-b: *01-01-02I*
c: *01-01-02N*
d: *01-01-02O*
e: *01-01-02P*
f-g: *01-01-02Q*
h: *01-01-02S*
i: *01-01-03A*
j-k: *01-01-04A*
l: *01-01-04C*
m: *01-01-04D*
n-o: *01-01-05A*
p: *01-01-05C*


a
b
c
d
e
f
g
h
i
j
k
l
5cm
m
n
o
p

slightly convex base in angular corner tangs. The cross section is biconvex.

Comments: This specimen resembles *Bulverde* points.

References: Bell 1960: 12, Pl. 6; Suhm and Jelks 1962: 169, Pl. 85.

Large Unstemmed Points *(01-01-05)*

01-01-05A N=2: 1 Reworked, 1 Fragmentary (Fig. (43 n-o)

The reworked specimen has a short rounded blade with a blunt tip. One edge has had two burin-like impact spalls removed. Neither specimen has shoulders and the stem areas are parallel and ground to form slightly concave edges. The tangs are relatively pointed and the bases are deeply concave. Cross sections are biconvex.

Comments: These resemble *Dalton* points.

References: Bell 1958: 18, Pl. 9.

01-01-05C N=1: 1 Fragmentary (Fig. 43 p)

This specimen has a long broad rectangular blade with finely worked straight edges. It does not have shoulders nor is there any attempt at notching or hafting. The tangs are square and the base is slightly concave. It has a thin biconvex cross section.

Comments: This specimen may represent a preform even though fine edge alteration is present.

Small Expanding Stemmed/Corner-Notched Points *(01-01-06)*

01-01-06A N=15: 6 Complete, 9 Fragmentary (Fig. 44 a-c)

These specimens have broad to narrow triangular blades with straight to convex blade edges, prominent short barbed or non-barbed shoulders, narrow, deep corner notches, and moderately expanding stems. The blade edges on two specimens are slightly serrated. The widest part of the point occurs at the shoulder of 13 specimens and at the base of the other two. Basal tangs are sharply defined on three specimens and rounded on twelve others. The bases are predominantly straight to convex, but one specimen has a slightly concave base. Cross sections tend to be plano-convex. Most specimens appear to be made from flakes.

Comments: These resemble the *Scallorn* type.

References: Bell 1960: 84, Pl. 42; Suhm and Jelks 1962: 285, Pl. 143.

01-01-06B N=2: 2 Complete (Fig. 44 d-e)

These specimens have short, broad triangular blades with straight edges, slightly barbed shoulders, relatively narrow corner notches, and straight stems. The basal tangs are angular and the bases are straight. Both specimens are made from flakes and show original flake surfaces on one face. The widest part of these specimens occurs at the barbed shoulders. The cross sections are plano-convex.

Comments: They resemble the *Bonham* variety *Tahlequah* type.

References: Brown 1976: 65, Fig. 17 l-x; Bell 1960: 10, Pl. 15.

01-01-06E N=1: 1 Reworked (Fig. 44 f)

This specimen has a blunt tip, extremely short, broad triangular blade, and well defined shoulders. The point is asymmetrical with one notch cut into the side, while the other is cut into the corner. The stem is moderately expanding. Tangs are rounded and pointed and the base is slightly convex. The cross section is biconvex. This specimen appears to be reworked.

01-01-06F N=1: 1 Complete (Fig. 44 g)

This specimen has a long triangular blade with straight edges, asymmetrically prominent, shallow corner notches and a mildly expanding stem. The tangs are rounded and the base is straight. This specimen is crudely made from a flake and has a plano-convex cross section with cortex on the convex surface near the tip. The widest part occurs at the shoulder.

01-01-06G N=1: 1 Fragmentary (Fig. 44 h)

This specimen is relatively thick and has a triangular blade with straight edges, rounded shoulders, broad side notches, moderately expanding stem, and sharp basal tangs. The base is moderately concave. The widest part is at the shoulders. The cross section is biconvex.

Comments: It resembles the *Frio* point, but has much finer workmanship and is smaller.

01-01-06H N=1: 1 Complete (Fig. 44 i)

This specimen is relatively thick and has a triangular blade with straight serrated blade edges. The shoulders are rounded with broad, very shallow corner notches. The stem is slightly expanding and asymmetrically aligned with the blade axis. The base is straight and formed by the unmodified striking platform of the flake from which this point was made. Tangs are angularly defined. The cross section is plano-convex.

Small Expanding Stemmed/Side-Notched Points *(01-01-07)*

01-01-07A N=2: 1 Complete, 1 Fragmentary (Fig. 44 j-k)

These specimens are small triangular points with straight, plain, and serrated blade edges and prominent shoulders. The side notches are relatively broad and deep, and the stems are moderately expanding. The shoulders and base are approximately equal in width. The tangs are rounded and the base is distinguished by broad, deep basal notch. Both have been made from flakes and have plano-convex cross sections.

Comments: They resemble the *Morris* type.

References: Bell 1958: 60, Pl. 30.

01-01-07B N=3: 2 Complete, 1 Fragmentary (Fig. 44 l-n)

These specimens are small triangular points with straight blade edges and narrow, relatively deep side notches placed near the middle of the blade edge. The stems are in line with the blade edges and the tangs are angular to rounded. The tangs are the widest part of these points. The bases on two specimens are straight, and concave on the third. All have plano-convex cross sections.

Comments: They resemble the *Washita* types *Garvin* and *Peno* varieties.

References: Brown 1976: 105, Fig. 20a-z, 108, Fig. 20h-j; Bell 1958: 98, Pl. 49.

01-01-07C N=1: 1 Complete (Fig. 44 o)

This specimen has a triangular blade with straight, slightly serrated blade edges. Narrow, relatively deep side notches are placed close to the base. The stem is not in line with the blade edges. Both the shoulders and tangs are the widest parts of this specimen. Tangs are angular and the base is straight. The base is asymmetrically aligned with the blade. The cross section is plano-convex.

Comments: This specimen resembles the *Reed* type.

References: Bell 1958: 76, Pl. 38; Brown 1976: 104, Fig. 19 d-n.

01-01-07D N=1: 1 Complete (Fig. 44 p)

This small point has a relatively long, narrow triangular blade with straight edges, prominent shoulders defined by relatively narrow, shallow side notches, and a bulbous base. The shoulders are the widest part of this point. The cross section is plano-convex.

Comments: This specimen resembles the *Hayes Short* type.

References: Brown 1976: 66, Fig. 12 o-y; Bell 1958: 32, Pl. 16; Suhm and Jelks 1962: 277, Pl. 139.

01-01-07E N=2: 2 Complete (Fig. 44 q-r)

These points have relatively long, narrow triangular blades with moderate to slightly sinuous straight edges. The shoulders are not prominent but are defined by broad, relatively deep side notches. The tangs are pointed and formed by the juncture of the notch and the convex base. Tangs are the widest part of the point. Both are made from flakes and have plano-convex cross sections.

Small Unstemmed Points *(01-01-08)*

01-01-08B N=1: 1 Complete (Fig. 44 s)

This specimen is characterized by a triangular blade and slightly convex edges. The basal tangs are pointed and formed by the juncture of the blade edges and the concave base. The basal tangs are the widest part of the point. Its cross section is plano-convex.

Comments: *It* resembles the *Maud* type.

References: Bell 1958: 48, Pl. 24; Suhm and Jelks 1962: 281, Pl. 141.

01-01-08C N=1: 1 Complete (Fig. 44 t)

This specimen has a blunt tip, recurved blade edges, rounded basal tangs, and convex base with a deep, wide basal notch. The basal tangs are the widest part of this point. The specimen is thick and has a plano-convex cross section.

DRILLS (02-00)

Shaped Base Drills *(01-02-01)*

01-02-01B N=1: 1 Fragmentary (Fig. 44 w)

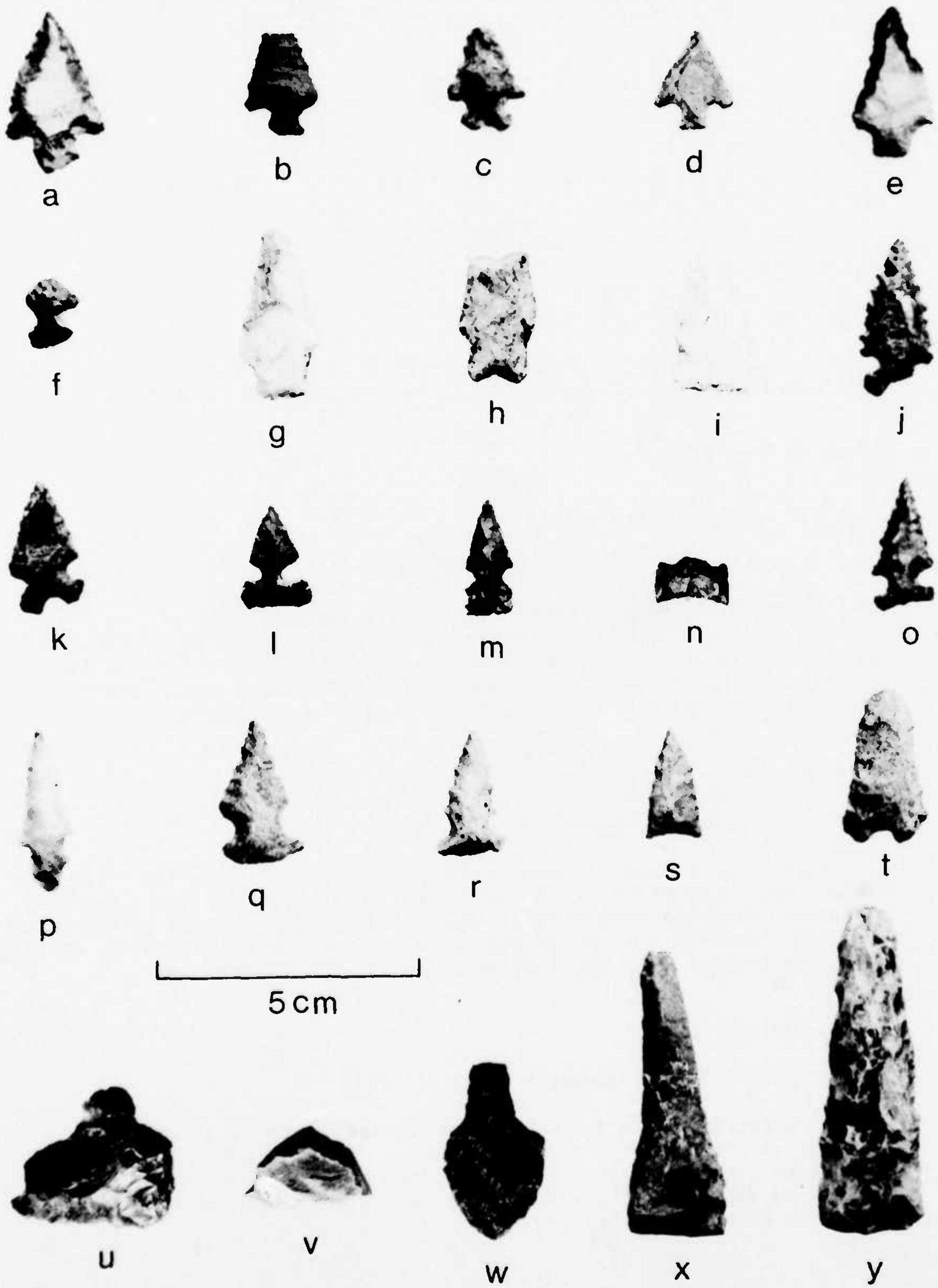
This specimen has a thin, ovate form with a narrow shank projection. The base is carefully shaped with minute edge alteration on both faces.

01-02-01C N=5: 2 Complete, 3 Fragments (Fig. 44 x-y)

These specimens have pin or ensiform shapes with rectangular bases and broad, gradually tapering shanks. Cross sections are relatively

Fig. 44. Selected chipped stone artifacts from the Blessingame site (34Pu-74).

a-c:	*01-01-06A*
d-e:	*01-01-06B*
f:	*01-01-06E*
g:	*01-01-06F*
h:	*01-01-06G*
i:	*01-01-06H*
j-k:	*01-01-07A*
l-n:	*01-01-07B*
o:	*01-01-07C*
p:	*01-01-07D*
q-r:	*01-01-07E*
s:	*01-01-08B*
t:	*01-01-08C*
u:	*01-08-01A*
v:	*01-03-01A*
w:	*01-02-01B*
x-y:	*01-02-01C*


a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
5 cm
u
v
w
x
y

thick and biconvex. One specimen is reworked. The tip and lateral shank edges on another specimen is dull with minute step scars on alternate shank edges. The flake scars are worn and slightly polished.

Drill Fragments and Segments *(01-02-03)*

01-02-03A N=9

Specimens in this category are tip and narrow shank segments. All have relatively thick cross section and worn tips and edges.

WEDGES (03-00)

01-03-01A N=1: 1 Complete (Fig. 44 v)

This specimen has a thick triangular wedge shape and exhibits minute spalls and battering along one edge. The obverse side is battered.

SCRAPERS (05-00)

Bifacial Scrapers *(01-05-01)*

01-05-01A N=8: 8 Complete (Fig. 45 j)

Edge modification on these specimens is characterized by long, overlapping unifacial flake scars forming a steep edge angle on a convex portion of a flake. Half the specimens have flaking on the distal end and the modification on the other specimens occurs on a lateral edge. Minimal shaping of the original flake is apparent on five specimens.

HOES (07-00)

01-07-01A N=2: 2 Fragmentary (Fig. 47 i)

These specimens are fragments from thin slabs of shale that have been roughly shaped by percussion flaking. Both exhibit polish and occasional striations oriented perpendicular to the edge. Shapes cannot be determined from the fragmentary nature of the specimens. One has a projection opposite the polished edge which may have served as a stem for hafting.

TANGED BIFACES (08-00)

01-08-01A N=1: 1 Fragmentary (Fig. 44 u)

This specimen is a thick biface which has a crudely triangular outline and a short, stubby tang or stem projecting from one edge. The tang probably represents a hafting element. The specimen has a biconvex cross section and has minute edge alteration along all edges. The tip of the blade is broken while the base is reworked.

BACKED BIFACES (09-00)

01-09-01A N=12: 9 Complete, 3 Fragmentary (Fig. 45 h)

These specimens have rectangular, triangular, or lunate forms with a relatively thin wedge shaped cross section. The sharp edge is characterized by minute edge alteration, but lacks grinding or battering characteristic of the wedge variety. The other edge is naturally backed. Cortex occurs on the back of eight specimens.

BIFACES (10-00)

Cobble/Quarried Block Biface I *(01-10-01)*

01-10-01A N=61: 61 Complete (Fig. 45 b)

These specimens are large, relatively thick, irregularly shaped cobbles or pebbles which have been bifacially flaked. Cortex covers most of one or both surfaces and the specimens have sinuous edges. Flake scars are large. The cross sections and outlines generally reflect the shape of the cobble. The range of measurements are: 33-101 mm (length), 31-91 mm (width), and 10-49 mm (thickness).

Cobble/Block Biface II/Thick Biface *(01-10-02)*

01-10-02A N=310: 116 Complete, 194 Fragmentary (Fig. 45 c)

These specimens have relatively thick, irregular cross sections and large bifacial flake scars. They exhibit little or no shaping and have little or no cortex. The shaped specimens are generally ovate to slightly triangular in form. The edges are sinuous to slightly sinuous. Complete specimens range from 22-135 mm (length), 19-80 mm (width), and 11-55 mm (thickness). Of the 194 broken specimens, 52% represent rounded, ovate or squared ends; 31% have pointed or slightly pointed ends; 6% are medial sections, and 11% are lateral segments.

Thin Biface I *(01-10-03)*

01-10-03A N=112: 34 Complete, 78 Fragmentary (Fig. 45 e)

These specimens show some concern in shaping and thinning. They are ovate to slightly triangular in form and the cross sections are uniformly thinned with little or no cortex on the faces. The edges are slightly sinuous. Most are made from bifacially reduced cobbles, but 18% of the complete specimens are made from large flakes. Of the 78 broken specimens, 37% are broad ovate or slightly rectangular in form, 38% are mid-sections, 14% are narrow, pointed ends and 10% are lateral edge segments. Three slightly rectangular specimens have been thinned along the broken edge.

The range of measurements is: 21-78 mm (length), 15-53 mm (width), and 4-8 mm (thickness).

Thin Biface IIa *(01-10-04)*

01-10-04A N=32: 8 Complete, 24 Fragmentary (Fig. 45 f)

These specimens are shaped but lack a hafting element. They are uniformly thinned and lack cortex. The edges are regular, non-sinuous, and flake scars are small. All broken specimens have broad oval to slightly rectangular proximal sections. Thirty-eight percent of the sample are small bifaces and 63% are from large bifaces.

Thin Biface IIb *(01-10-05)*

01-10-05A N=20: 7 Complete, 13 Fragmentary (Fig. 45 g)

These are shaped specimens which display some indication of a haft element. The haft may be one or two notches or the constriction of the base. Cross sections are uniformly thinned and the edges are regular and non-sinuous. The flake scars are narrow and extend to the center of the specimen. None of the specimens have cortex. Thirteen specimens are from large bifaces and seven are from small bifaces.

BIFACE IMPLEMENTS (11-00)

Cobble Biface I Tools *(01-11-01)*

01-11-01A N=2: 2 Complete

These specimens are similar to the cobble/quarried block biface I *(01-10-01A)* reduction, but display minute edge alteration on one or more edges. Both specimens are thick and have cortical weathering on more than half of the surface. The edges are sinuous and the overall shape reflects the original cobble form. The edge alteration is characterized by minute,discontinuous flake scars.

Cobble Biface II Tools *(01-11-02)*

01-11-02A N=3: 3 Fragmentary

These items are fragmentary specimens of cobble/block biface II/ thick bifaces *(01-10-02A)* which display irregular,minute edge alteration along one or more edges. The specimens are thick with less than half of their surfaces covered with cortex. Their shape largely reflects the original cobble form.

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)

01-12-01A N=210

These specimens are broken segments of unidentifiable points *(01-01 00)*, thin biface IIa *(01-10-04A)* and thin biface IIb *(01-10-05A)* varieties. Specimen thickness, blade angle, and size indicates that 91% represent large point or biface fragments and that 9% are from small points or bifaces. Of the 191 large specimens 40% are distal fragments, 37% are medial segments, and 23% are proximal fragments. The proximal sections from large points include 22 unidentifiable expanding stem and corner-notched points *(01-01-02)* and 21 contracting stemmed point fragments *(01-01-01)*.

MODIFIED FLAKES (13-00)

01-13-01A N=26 (Fig. 45 m-o)

These specimens display minute edge alteration along a single point or projection. Modification occurs on or adjacent to a natural projection formed by a major flake ridge on 58% of the sample, while the modification on 42% of the sample has created an artificial projection along the lateral flake edge. The modification consists of short flake scars and nicks occurring at regular and irregular intervals along the edge and tip of the projection.

01-13-01B N=263 (Fig. 45 k)

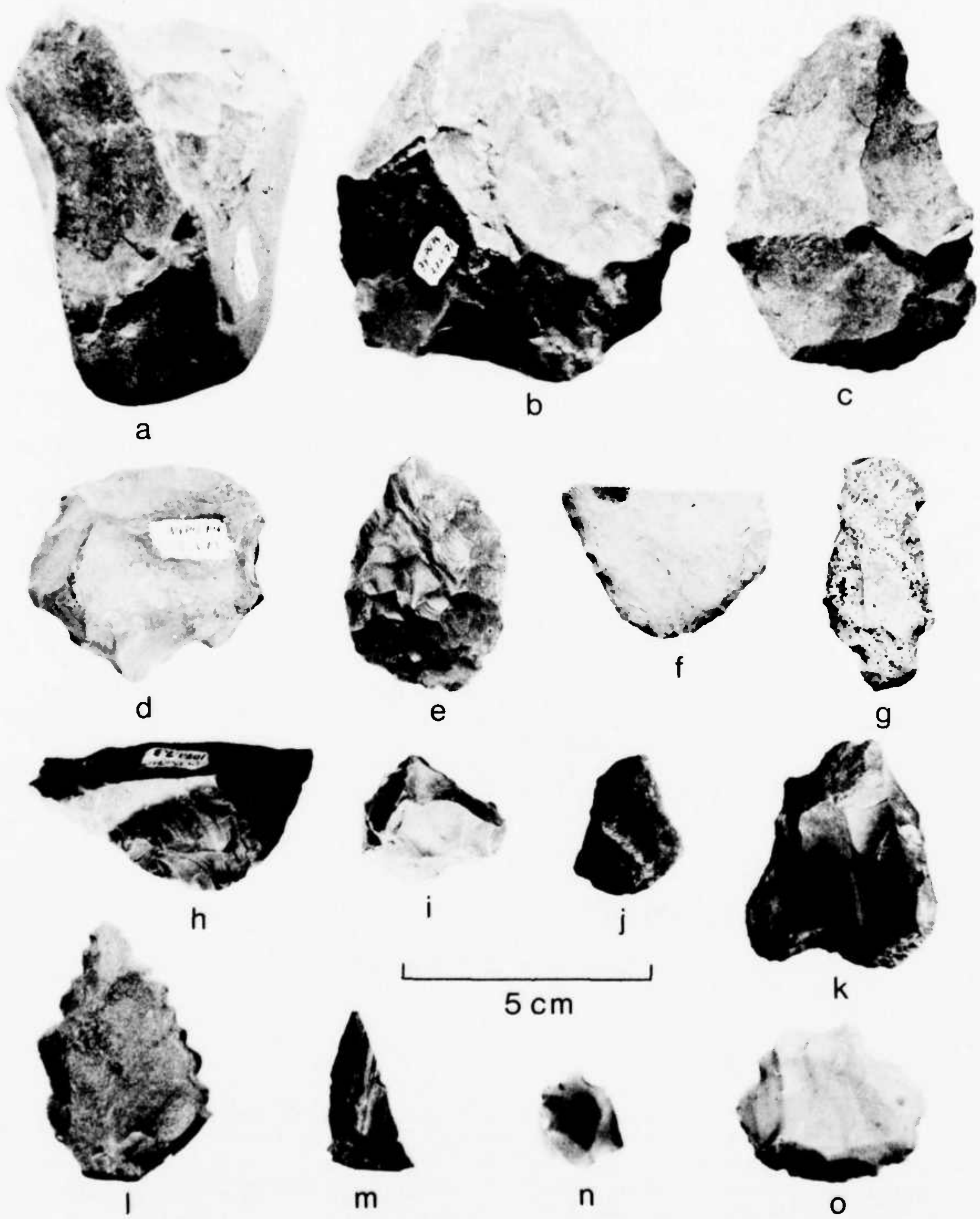
This variety consists of flakes which show minimal shaping but have some unifacial edge alteration present on one or more edges. The shape of the modified edge is relatively straight on 86% of the sample, convex on 9% and concave on 5%. The modification appears as short and minute flake scars and nicks occurring unifacially at regular and irregular intervals. The flake scars on 9% of the sample are large and irregular. Presumably this kind of edge alteration is due to knapping as opposed to incidental modification of the flake.

01-13-01C N=6 (Fig. 45 l)

These specimens have from four to eight projections spaced evenly along one or more lateral edges of the flake. The serrated edge has been produced by unifacial knapping and on three specimens, the points are rounded and battered from use.

Fig. 45. Selected chipped stone artifacts from the Blessingame site (34Pu-74).

a: *01-15-02A*
b: *01-10-01A*
c: *01-10-02A*
d: *01-14-01A*
e: *01-10-03A*
f: *01-10-04A*
g: *01-10-05A*
h: *01-09-01A*
i: *01-16-02A*
j: *01-05-01A*
k: *01-13-01B*
l: *01-13-01C*
m-o: *01-13-01A*


a
b
c
d
e
f
g
h
i
j
k
5 cm
l
m
n
o

CORES (14-00)

01-14-01A N=6: 6 Complete (Fig. 45 d)

These specimens are split cobble sections which have large flake scars consistently removed from the dorsal surface. They are irregularly plano-convex in cross section with the edge against the planar surface. The split surface has been used as a striking platform for removing cortex and large flakes from the dorsal side. All specimens are relatively thick and exhibit no shaping. Measurements range from 28-79 mm (length), 22-70 mm (width), and 19-38 mm (thickness).

SPLIT/TESTED COBBLES (15-00)

Split Cobbles (01-15-01)

01-15-01A N=14: 14 Complete

These specimens are split sections of cobbles which are characterized by an irregular plano-convex cross section. The planar surface is characteristically achieved by a single large flake scar. Cortex covers much of the dorsal surface. Additional knapping may have removed flakes from either the dorsal or ventral surfaces. The specimens are generally thick and exhibit no evidence of shaping. The edges are in close proximity to the ventral surface and are often sinuous. The specimens range from 34-74 mm (length), 24-66 mm (width), and 11-30 mm (thickness).

Tested Cobbles (01-15-02)

01-15-02A N=42 42 Complete (Fig. 45 a)

These specimens are rounded cobbles and pebbles which have from one to ten large flake scars usually on a single face. The edges are generally not sinuous since cortex abuts the flake scars. Cortex covers most of these specimens. The size generally reflects the cobble selected. They range from 28-102 mm (length), 19-47 mm (width), and 12-39 mm (thickness).

DEBITAGE (16-00)

01-16-01A N=77,520

These specimens represent unmodified flake debitage recovered during dry screen excavations.

01-16-02A N=27

Specimens in this variety are angular, thick blocks of chert. Most are irregular in shape and lack cortex. The faces are characterized by a few large flake scars. Some have sinuous edges, but most often the faces meet at an abrupt angle. These specimens range from 16-40 mm (length), 14-47 mm (width), and 3-40 mm (thickness).

Table 49. Metric attributes for selected chipped stone varieties from 34Pu-74.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-01A					
$\bar{x}$	55.3	30.7	6.9	16.1	16.6
s.d.	11.1	7.3	1.3	3.9	4.8
range	18.0-77	18.0-43	4.6-10.0	10.0-26.0	7.0-29.0
N	11	20	35	35	34
01-01-01B					
$\bar{x}$	68.0	28.5	7.0	15.0	17.0
N	1	1	1	1	1
01-01-01C					
$\bar{x}$	-	16.9	6.0	10.8	9.0
s.d.	-	0.15	.55	3.8	3.0
range	-	16.7-17.0	5.4-6.5	7.0-14.5	6.0-12.0
N	-	2	2	2	2
01-01-02A					
$\bar{x}$	-	28.8	9.5	11.3	18.3
s.d.	-	1.5	2.3	3.3	.9
range	-	27.0-31.0	6.3-8.5	6.0-15.0	17.0-19.3
N	-	4	4	4	4
01-01-02B					
$\bar{x}$	-	27.0	7.2	10.0	19.6
s.d.	-	0.5	0.9	0.5	0.4
range	-	26.0-27.0	6.3-8.0	9.0-10.0	19.2-20.0
N	-	2	2	2	2
01-01-02D					
$\bar{x}$	-	21.6	6.8	9.5	14.9
s.d.	-	2.1	.92	1.4	1.8
range	-	19.4-25.0	5.0-8.3	7.0-11.0	10.0-16.5
N	-	5	10	9	10
01-01-02E					
$\bar{x}$	26.5	20.5	7.1	8.3	15.3
s.d.	4.5	2.5	0.7	2.3	2.5
range	22.0-31.0	17.0-22.6	6.4-8.3	6.0-11.0	13.0-18.8
N	2	3	4	4	3

Table 49. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-02D					
$\bar{x}$	-	-	5.8	11.0	16.0
s.d.	-	-	0.2	1.0	-
range	-	-	5.6-6.0	10.0-12.0	-
N	-	-	2	2	1
01-01-02I					
$\bar{x}$	61.0	29.2	8.1	11.3	11.8
s.d.	1.4	0.2	0.2	1.2	0.6
range	59.6-62.4	29.0-29.4	8.0-8.4	10.0-13.0	6.4-15.0
N	2	2	3	3	3
01-01-02K					
$\bar{x}$	-	-	8.0	7.0	19.4
N	-	-	1	1	1
01-01-02L					
$\bar{x}$	32	21.6	6.9	10.0	16.1
s.d.	-	2.6	0.6	2.3	2.6
range	-	19.0-27.2	6.0-8.0	6.0-12.5	11.0-20.0
N	1	7	8	6	8
01-01-02M					
$\bar{x}$	50.6	20.3	6.8	12.7	15.8
s.d.	4.0	1.2	0.5	2.4	0.3
range	46.6-54.5	19.0-22.0	6.0-7.3	9.0-15.0	15.4-16.2
N	2	3	4	4	4
01-01-02N					
$\bar{x}$	-	25.9	6.9	12.7	15.4
s.d.	-	1.2	0.2	1.7	0.4
range	-	24.7-27.0	6.7-7.0	11.0-14.4	15.0-15.7
N	-	2	2	2	2
01-01-020					
$\bar{x}$	45.5	36.5	5.6	10.0	15.0
N	1	1	1	1	1

Table 49. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-02P					
$\bar{x}$	42.2	20.8	7.0	17.0	12.8
N	1	1	1	1	1
01-01-02Q					
$\bar{x}$	46.0	29.0	7.3	10.1	16.0
s.d.	-	-	0.6	0.1	0.5
range	-	-	6.5-8.0	10.0-10.3	15.3-16.5
N	1	1	3	3	3
01-01-02S					
$\bar{x}$	30.1	26.5	6.7	10.7	20.2
s.d.	2.1	2.1	0.5	0.5	0.9
range	28.0-32.2	24.4-28.5	6.0-7.0	10.0-11.0	19.0-21.0
N	2	2	3	3	3
01-01-03A					
$\bar{x}$	58.0	-	7.0	14.0	-
N	1	-	1	1	-
01-01-04A					
$\bar{x}$	40.5	25.8	6.5	14.6	12.9
s.d.	0.5	2.3	0.4	6.0	2.5
range	40.0-41.0	23.5-28.0	6.0-7.0	9.0-26.0	8.0-14.5
N	2	2	5	5	5
01-01-04C					
$\bar{x}$	44.0	37.0	7.0	13.0	15.0
N	1	1	1	1	1
01-01-04D					
$\bar{x}$	-	-	8.0	22.0	19.5
N	-	-	1	1	0
01-01-05A					
$\bar{x}$	16.5	22.1	6.2	-	-
s.d.	-	0.1	0.2	-	-
range	-	22.0-22.2	6.0-6.3	-	-
N	1	2	2	-	-

Table 49. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-05C					
$\bar{x}$	-	22.5	8.3	-	-
N	-	1	1	-	-
01-01-06A					
$\bar{x}$	24.7	15.5	3.6	6.0	7.6
s.d.	3.0	1.9	0.6	1.0	1.5
range	21.4-30.0	13.0-18.0	2.6-4.5	4.5-8.0	4.4-10.0
N	6	9	15	14	15
01-01-06B					
$\bar{x}$	23.5	15.1	3.5	4.5	6.1
s.d.	4.8	0.1	0.9	0.5	1.4
range	18.7-28.2	15.0-15.1	2.6-4.3	4.0-5.0	4.7-7.5
N	2	2	2	2	2
01-01-06E					
$\bar{x}$	12.5	10.0	3.0	7.0	5.0
N	1	1	1	1	1
01-01-06F					
$\bar{x}$	32.0	15.0	4.5	7.0	10.0
N	1	1	1	1	1
01-01-06G					
$\bar{x}$	-	14.1	6.0	7.0	10.6
N	-	1	1	1	1
01-01-06H					
$\bar{x}$	26.4	15.0	6.6	8.0	13.0
N	1	1	1	1	1
01-01-07A					
$\bar{x}$	26.8	13.3	3.5	7	7.4
s.d.	2.7	0.3	0.5	-	0.7
range	24.1-29.4	13.0-13.6	3.0-4.0	-	6.7-8.0
N	2	2	2	1	2

Table 49. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-07B					
$\bar{x}$	20.3	13.7	2.8	13.8	5.2
s.d.	1.3	0.4	0.3	5.7	0.2
range	19.0-21.6	13.3-14.0	2.3-3.0	7.5-9.0	5.0-5.5
N	2	2	3	3	3
01-01-07C					
$\bar{x}$	25.0	11.5	3.0	6.0	6.0
N	1	1	1	1	1
01-01-07D					
$\bar{x}$	30.0	10.3	3.7	9.0	6.0
N	1	1	1	1	1
01-01-07E					
$\bar{x}$	24.8	14.1	4.5	7.8	11.1
s.d.	1.8	1.1	0.5	1.3	4.1
range	23.0-26.5	13.0-15.2	4.0-5.0	6.5-9.0	7.0-15.2
N	2	2	2	2	2
01-01-08B					
$\bar{x}$	21.0	10.4	2.4	-	-
N	1	1	1	-	-
01-01-08C					
$\bar{x}$	28.4	16.2	6.3	-	-
N	1	1	1	-	-
01-02-01B					
$\bar{x}$	-	18.8	5.0	-	7.2
N	-	1	1	-	1
01-02-01C					
$\bar{x}$	60.2	16.7	7.2	-	-
s.d.	-	2.4	1.2	-	-
range	-	14.0-20.0	6.0-9.4	-	-
N	1	5	5	-	-

Table 49. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-02-03A					
$\bar{x}$	-	-	5.0	-	9.7
s.d.	-	-	0.9	-	1.0
range	-	-	3.0-6.1	-	8.1-11.2
N	-	-	9	-	6
01-03-01A					
$\bar{x}$	25.2	16.0	14.0	-	-
N	1	1	1	-	-
01-05-01A					
$\bar{x}$	30.1	23.0	7.4	-	-
s.d.	7.3	4.3	1.4	-	-
range	20.0-43.6	16.2-29.8	5.0-10.0	-	-
N	8	8	8	-	-
01-07-01A					
$\bar{x}$	-	71.1	10.9	-	-
s.d.	-	-	0.1	-	-
range	-	-	10.8-11.0	-	-
N	-	1	2	-	-
01-08-01A					
$\bar{x}$	30.0	26.1	7.8	7.3	10.0
N	1	1	1	1	1
01-09-01A					
$\bar{x}$	46.6	29.4	14.7	-	-
s.d.	8.3	7.9	3.1	-	-
range	33.3-58.2	17.3-42.0	9.5-19.5	-	-
N	10	11	12	-	-

Fired Clay *(02)*

CERAMICS (01-00)

Plain Grog, Grit, and Bone Tempered Wares *(02-01-01)*

02-01-01A N=15: 1 Rim sherd, 14 Body sherds (Fig. 46 a-b)

Definition: A coarsely textured grog-grit tempered plainware with thick walls.

Method of Manufacture: Coiling.

Paste:

Tempering: The tempering material consists mainly of grog (crushed sherds). The small amount of grit present may be accidental inclusions.

Texture: Most sherds have a coarse texture. The grog inclusions range up to 3 mm. The paste is gritty.

Surface Treatment: Most surfaces are eroded and pitted. Five sherds have smooth surfaces with occasional smoothing striations. None are burnished or display a slip or wash.

Color:

Exterior: Gray brown (33%), brown (7%), red brown (27%), light brown (7%), red (7%), red yellow (7%), light red brown (7%), and very dark gray brown (7%).

Interior: Gray brown to black.

Thickness: Range 6.5-11.3 mm; $\bar{x}$ = 8.7 mm.

Form: Indeterminate. The small rim sherd appears to be a direct rim with a flat lip sloping toward the vessel exterior.

Minimum Number of Vessels: 3. One vessel came from Structure 1 fill and two vessels are from Structure 2 fill. A single sherd came from below the floor in Structure 2.

Comments: *Williams Plain* (Brown 1971: 42)

02-01-01D N=1: 1 Rim sherd (Fig. 46 c)

Definition: A coarsely textured, grog tempered plainware.

Method of Manufacture: Coiling.

Paste:

Tempering: Predominantly coarse grog tempering, although some grit is also present.

Texture: The paste is gritty.

Surface Treatment: The surfaces are eroded. The harder grog temper particles protrude through the sherd surface and provide a gritty feel.

Color:

Exterior: The paste color is white to light gray, but the black, dark gray and red tempering inclusions gives the sherd a speckled appearance which is the primary distinguishing characteristic of this variety. Some of the raised red particles may be the original surface.

Interior: Same as the exterior.

Thickness: 5.1 mm.

Form: Rim from a wide mouth bowl. The rim is contracting and everted. The lip is rounded.

Minimum Number of Vessels: 1. This specimen is from the south wall interior fill of Structure 1.

Comments: This sherd does not conform to previously defined types.

Decorated Grog, Grit, and Bone Tempered Wares *(02-01-02)*

02-01-02A N=13: 1 Rim sherd, 12 Body sherds (Fig. 46 e-f)

Definition: A fine to moderately textured, grog, and bone tempered slipped ware.

Method of Manufacture: Coiling.

Paste:

Tempering: The major tempering constituent is grog (crushed sherds), but all specimens have some bone inclusions.

Texture: Fine to moderate.

Surface Treatment: Smoothed on the interior and exterior surfaces. Some wiping marks are visible. All sherds have been slipped.

Colors:

Exterior: Slip colors range from red (31%), red brown (23%), light red (23%), weak red (8%), and brown (15%).

Interior: Slightly darker.

Thickness: 5.1-7.4 mm; $\bar{x}$ = 6.0 mm.

Form: Indeterminate. The single rim sherd has a slightly everted, direct rim with a flat lip.

Minimum Number of Vessels: 3. One is from Structure 1 ash fill and two are from above the floor in Structure 2. One sherd was found below the floor surface of Structure 2.

Comments: *Sanders Plain* (Brown 1971: 164).

02-01-02B N=2: 2 Body sherds (Fig. 46 d)

Definition: A fine textured grog and bone tempered, engraved ware.

Method of Manufacture: Coiling.

Paste:

Tempering: Finely ground grog (crushed sherds) is the major tempering inclusion along with minor amounts of grit.

Texture: The paste has a smooth homogenous texture.

Surface Treatment: The exterior surface is more carefully smoothed than the interior, but neither surface shows burnishing. No slip is apparent. Both sherds have crudely executed parallel engraved lines spaced at 5mm intervals on the exterior surface. A small amount of red (hematite?) pigment is in a segment of one engraved line.

Colors:

Exterior: Dark gray brown.

Interior: Same as exterior.

Thickness: 8.9 mm.

Form: Indeterminate.

Minimum Number of Vessels: 1. Both sherds are from Level 1 southwest of Structure 2.

Comments: Decorative motifs resemble the undefined incised ware from the Williams I site (Newkumet 1940: 4). However, these sherds are engraved.

02-01-02C N=1: 1 Rim sherd (Fig. 46 g)

Definition: A fine textured, grog, and bone tempered red ware with crimped neck coils on the exterior surface.

Method of Manufacture: Coiling.

Paste:

Tempering: The predominant temper inclusion is grog (crushed sherds) with a small amount of bone.

Texture: Fine.

Surface Treatment: The interior is smoothed and the exterior has crimped coils consisting of three off-set rows of short, vertically oriented depressions which have been smoothed. Both surfaces have been slipped.

Colors:

Exterior: Slip color is reddish brown.

Interior: Same as exterior.

Thickness: 6.0 mm.

Form: Indeterminate. The rim is thinned (converging) and appears to be standing or direct. The lip is worn.

Minimum Number of Vessels: 1. This sherd was in the fill of Structure 1.

Comments: The temper, paste, texture, thickness, and slipped surface color are within the range of *Sanders Plain (02-01-02A)*. The lip treatment resembles that of *Nash Neck Banded* although the rim form and slip color do not conform to the described type (Suhm and Jelks 1962: 111).

Plain Shell Tempered Wares *(02-01-03)*

02-01-03A N=18: 18 Body sherds (Fig. 46 h-i)

Definition: A moderately textured leached shell tempered plainware.

Method of Manufacture: Coiling.

Paste:

Tempering: Predominantly shell with occasional pieces of grog and grit. The leached shell temper gives the pottery a porous appearance.

Texture: Moderate to fine.

Surface Treatment: All surfaces are eroded and pitted.

Colors:

Exterior: gray pink (59%), brown (12%), very pale brown (12%), gray brown (6%), light brown (6%), and light yellow brown (6%).

Interior: Mostly dark gray and black.

Thickness: Range 4.9-8.9 mm; $\bar{x}$ = 6.2 (N=12).

Form: Indeterminate.

Minimum Number of Vessels: 3. One is from the mound in Block A and two are from Structure 2.

Comments: *Woodward Plain* (Brown 1971: 141).

PIPE (02-00)

Red River Type *(02-02-01)*

02-02-01A N=1: 1 Complete (Fig. 46 j)

This black, unleached shell tempered clay pipe has a straight stem, flaring bowl, and distal projection. The stem is narrow (9-11 mm) with a bore diameter of 6 mm. The thin bowl is 33 mm high and flares from a base diameter of 17 mm to a rim diameter of 24 mm. The hollow projection extends 19 mm beyond the bowl and has an abrupt, flattened end. The total length of the stem and projection is 124 mm.

Comments: *Graves Chapel* variety of *Red River* Pipe (Hoffman 1967).

BAKED CLAY (03-00)

Baked Clay *(02-03-01)*

02-03-01A

Specimens in this category include amorphous fragments of burned or fired clay. None have stick or grass impressions. Most specimens are less than 70 mm in diameter. The dominant colors are pink, light gray, very pale brown, and occasionally light red and reddish yellow.

Fig. 46. Selected ceramic varieties and fired clay pipe from the Blessingame site (34Pu-74).

a-b: *02-01-01A*

c: *02-01-01D*

d: *02-01-02B*

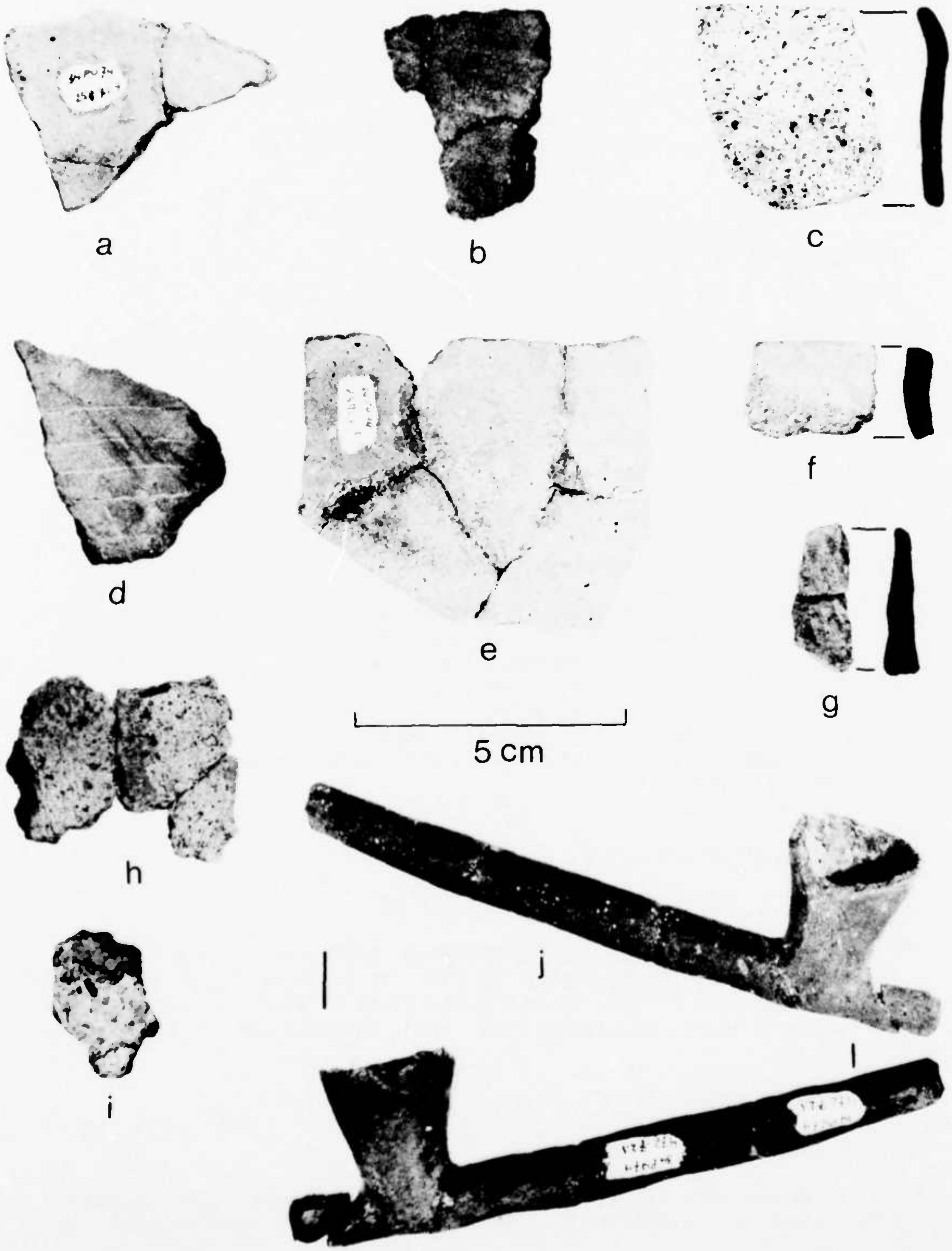
e-f: *02-01-02A*

g: *02-01-02C*

h-i: *02-01-03A*

j: *02-02-01A*

Note: Cross sections are drawn with the vessel exterior to the left.


a
b
c
d
e
f
g
h
5 cm
i
j

Comments: Baked clay was confined to Structures 1 and 2 and probably represents daub. Samples were not systematically collected after an initial sample of approximately 200 specimens was saved from each structure.

Ground Stone *(03)*

MANOS (01-00)

Unifacial Manos *(03-01-01)*

03-01-01A N=7: 4 Complete, 3 Fragmentary

Specimens in this category are elongated (4), to irregularly shaped (3) cobbles which exhibit grinding and smoothing on a single face. The oposite face is often irregular or undulating. The edges on six specimens have minimal to no pecking modification. One specimen has battered ends. Two specimens have been burned.

Bifacial Manos *(03-01-02)*

03-01-02A N=10: 5 Complete, 5 Fragmentary (Fig. 47 a,c)

These specimens are oval (2), slightly square (2), and elongated oval (6) cobbles which exhibit wear and grinding on two faces. The four oval and slightly square specimens are symmetrically shaped and have a biconvex cross section. Five elongated oval specimens reflect irregular cross sections. One elongated oval specimen is symmetrically shaped and has a wedge-shaped cross section. Occasional peck marks are discernable on edges and face areas but none show extensive battering. One specimen has been burned.

Faceted Manos *(03-01-03)*

03-01-03A N=1: 1 Complete (Fig. 47 b)

This specimen is an oval cobble with faceted wear patterns on two faces. The facet orientation on one face is at right angles to that on the opposite face. Thus, the ground surfaces of each face taper to form a relatively sharp, undulating edge. This specimen has not been burned.

Pitted Manos *(03-01-04)*

03-01-04A N=1: 1 Fragmentary

This specimen has a smooth mano-like ground surface and two pecked depressions on a single face. The opposite face has spalled off. The

pecked depressions are slightly overlapping and have a diameter of 16 and 18 mm with a depth of 1 and 2 mm respectively. This specimen is burned.

METATES/GRINDING SLABS (02-00)

Slab *(03-02-01)*

03-02-01A N=3: 3 Fragmentary (Fig. 47 g)

This category consists of fragmentary specimens of slab metates characterized by flat smooth surfaces and pecked marks. Two specimens have been used on both sides. None display shaping along the edge.

ABRADERS (03-00)

03-03-01A N=1: 1 Complete (Fig. 47 e)

One possible abrading stone has a single groove oriented perpendicular to the bedding plane of a tabular piece of sandstone. The groove measures 61 by 14 mm and has a depth of 6 mm. The longitudinal axis is slightly concave, rather than flat, and the groove has a rough, irregular, wide bottom. This specimen has been burned.

GROUND HEMATITE (04-00)

03-04-01A N=1: 1 Fragmentary (Fig. 47 g)

This specimen is a slightly rectangular piece of hematite which exhibits striations and wear facets on both faces. The edges are rounded to pointed. Despite extensive wear, this specimen lacks symmetry. It has been burned and is severely heat spalled.

Pecked/Battered/Unmodified Cobbles *(04)*

HAMMERSTONES (01-00)

04-01-01A N=1: 1 Complete (Fig. 47 f)

This specimen is a blocky, dense sandstone cobble which shows extensive battering on the end of a projection. Minor pecking has rounded the corners on the proximal end. The distal projection has a blunt tip and shows several spall scars and battering marks.

Fig. 47. Selected chipped, ground, and pecked/battered stone artifacts from the Blessingame site (34Pu-74).

a,c: *03-01-02A*

b: *03-01-03A*

d: *04-02-01A*

e: *03-03-01A*

f: *04-01-01A*

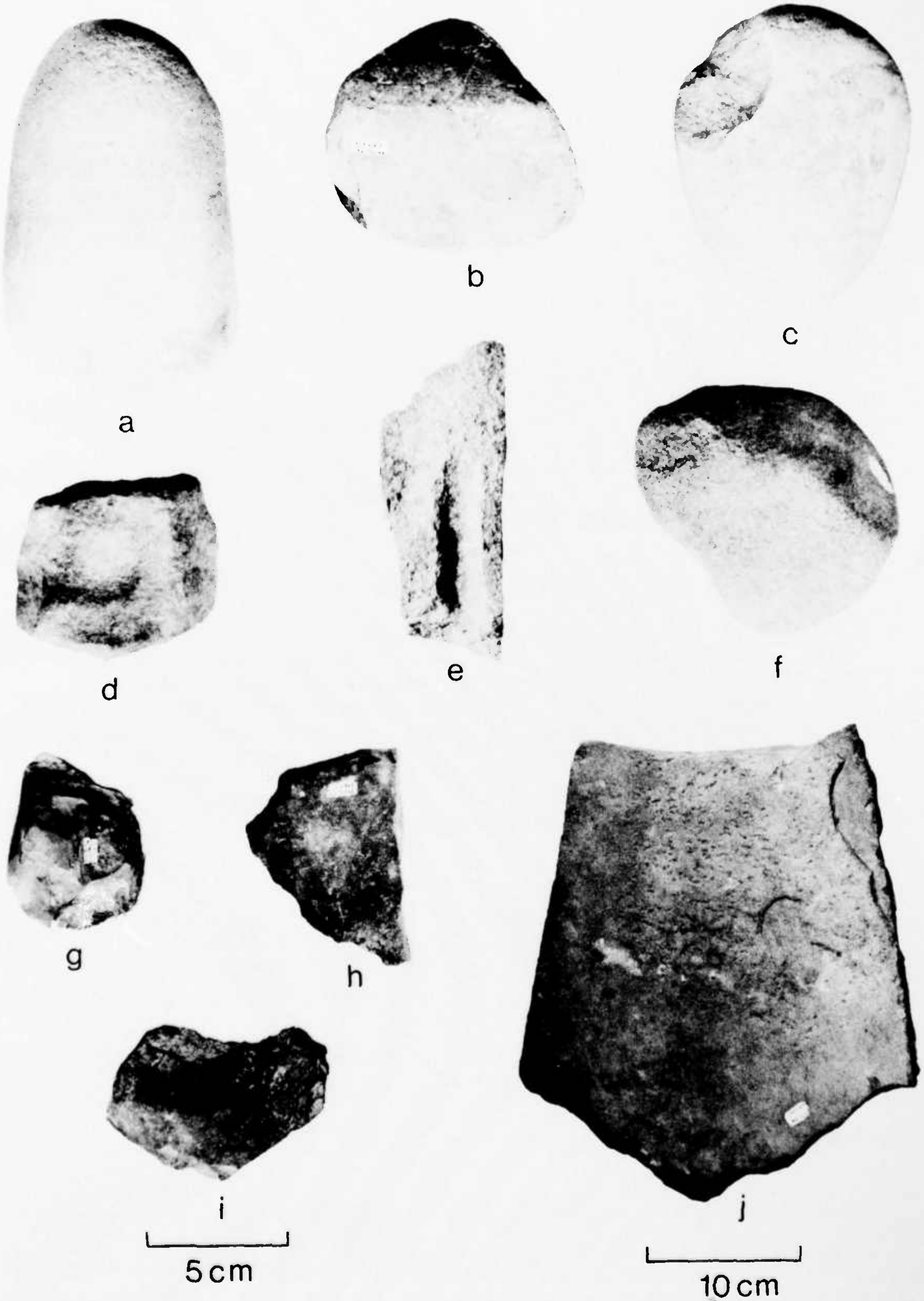
g: *03-04-01A*

h: *03-06-01A*

i: *01-07-01A*

j: *03-02-01A*

Note: Artifact j is shown at 10 cm scale.


a
b
c
d
e
f
g
h
i
j
5 cm
10 cm

PITTED STONES (02-00)

Unifacial *(04-02-01)*

04-02-01A N=7: 3 Complete, 4 Fragmentary (Fig. 47 d)

This category consists of rectangular to irregularly-shaped blocky sandstone cobbles which have a single pecked depression or pit on one face. The shape of these specimens reflects the morphology of the natural cobble. The depressions are centrally located in the face and range from 23-57 mm in diameter and from 1-6 mm deep.

Bifacial *(04-02-02)*

04-02-02A N=2: 2 Fragmentary

These specimens are irregular and slightly rectangular sandstone cobbles which have a single depression pecked into both faces. Except for the depression, neither specimen has been shaped. The size of depressions ranges from 23-35 mm in diameter and from 2-3 mm in depth. Both specimens have been burned.

MISCELLANEOUS PECKED/BATTERED STONE (03-00)

04-03-01A N=5: 1 Complete, 4 Fragmentary

These specimens are all made on irregularly shaped cobbles which show minimal pecking marks. The modification has not significantly altered the original shape of the cobble. Three specimens have blocky cross sections and two are oval. The peck marks are confined to the end of one specimen, the lateral edges and corners of two specimens, and the convex face of two specimens. These items may reflect discarded cobbles representing early stages in pecked or ground stone tool manufacturing.

UNMODIFIED COBBLES/PEBBLES (04-00)

Fossils *(04-04-02)*

04-04-02A N=1: 1 Fragmentary

This specimen is a fragment of a belemnite. The cylindrically shaped fossil is broken at both ends.

Table 50. Metric attributes for selected ground and pecked stone varieties from 34Pu-74.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS
03-01-01A			
$\bar{x}$	122.8	89.7	53.3
s.d.	20.1	11.5	9.7
range	93.0-146.0	75.0-113.0	33.0-61.0
N	4	6	7
03-01-02A			
$\bar{x}$	117.0	92.1	50.2
s.d.	21.7	24.3	8.1
range	78.0-138.0	57.0-138.0	40.0-64.0
N	5	8	10
03-01-03A			
$\bar{x}$	98.0	88.0	40.0
N	1	1	1
03-01-04A			
$\bar{x}$	102.0	-	-
N	1	-	-
03-02-01A			
$\bar{x}$	195.0	155.0	52.3
s.d.	71.0	63.9	25.0
range	100.0-270.0	71.0-226.0	26.0-86.0
N	3	3	3
03-03-01A			
$\bar{x}$	119.0	48.0	23.0
N	1	1	1
03-04-01A			
$\bar{x}$	69.0	55.0	18.0
N	1	1	1
03-06-01A			
$\bar{x}$	-	119.5	17.5
s.d.	-	34.5	1.5
range	-	85.0-154.0	16.0-19.0
N	-	2	2

Table 50. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS
04-01-01A			
$\bar{x}$	105.0	63.0	53.0
N	1	1	1
04-02-01A			
$\bar{x}$	93.8	66.6	44.8
s.d.	18.2	5.1	8.4
range	75.0-97.0	58.0-74.0	34.0-59.0
N	4	5	6
04-02-02A			
$\bar{x}$	77.5	78.0	36.0
s.d.	7.5	3.0	1.0
range	70.0-85.0	75.0-81.0	35.0-37.0
N	2	2	2
04-03-01A			
$\bar{x}$	11.4	84.0	37.3
s.d.	-	5.7	8.1
range	-	79.0-92.0	26.0-44.0
N	1	3	3
04-04-01B			
$\bar{x}$	20.0	8.0	-
N	1	1	-
04-04-01D			
$\bar{x}$	48.0	27.0	21.0
N	1	1	1

CONCRETIONS (04-04-03)

04-04-03A N=1: 1 Fragmentary

This broken specimen is from a hollow spherical hematite concretion. It has a glossy exterior, but lacks striations and evidence of polishing. The interior surface is dull.

Unmodified Nodules-Special Context *(04-04-04)*

04-04-04A N=1: 1 Complete

This specimen is a rectangular piece of green chert (Type C) that shows no evidence of modification. All surfaces have cortex and the edges are stream battered. It was found in a special context on the floor surface near the center of Structure 1.

Historic Debris *(07)*

METAL (03-00)

Fence Staples *(07-03-04)*

07-03-04A N=1

One iron U-shaped fence staple.

Barbed Wire *(07-03-05)*

07-03-05A N=2

Both specimens are short sections of barbed wire. They conform to Glidden's Barb, Common Variety (Clifton 1970: 99).

Cartridges *(07-03-06)*

07-03-06A N=1

This specimen is a .22 calibre long cartridge with a "Super H" head stamp.

Buckles *(07-03-08)*

07-03-08A N=1

This item is a small (32 x 26 mm) rectangular strap buckle with a movable tongue.

Miscellaneous Metal items *(07-03-09A)*

07-03-09A N=1

This item is an unidentified iron disc (18 mm in diameter) with a beveled edge and a slightly concave surface on one side.

PLASTIC (04-00)

07-04-01A N=26

Specimens included in this category are small fragments from a single opaque, milk-white plastic jug. They range from 0.6-2.9 mm in thickness. One has a straight raised or embossed line. None show maker's or commercial marks.

Faunal *(08)*

BONE/HORN/TEETH (01-00)

08-01-01A N=15

All specimens are unmodified fragments of animal bone (Table 51). Eighty-seven percent are burned. One of these is tentatively identified as a fragment from a left ulna of a juvenile deer. One unburned specimen is a pair of rodent incisors with dessicated skin attached. The fifteen specimens weigh 7.0 g.

SHELL (02-00)

Mollusc (08-02-01)

08-02-01A N=7

These specimens are pieces of fresh water mussel shell or naiads (Table 51). The fragmentary condition prevented species identification. Total weight is 6.1 grams.

Gastropods (08-02-02)

08-02-02A N=1

This specimen is a complete gastropod. Species identification was not attempted.

Floral *(09)*

A small quantity of nuts and seeds were recovered during the excavations (Table 51). Most unburned specimens were found in the upper 10 cm

Table 51. Summary of faunal and floral remains at 34Pu-74.

Material	Level (10 cm)	Ct.	Wt.	Identification	Feature Association
FAUNAL REMAINS					
Bone:					
Unburned					
A21-13	3	1	0.1g		Below F78-9
B35-9	4	1	0.3g	Incisors (rodent)	
Burned					
B30-22	4	1	0.1g		
B30-24	2	1	0.6g		
B35-11	4	1	0.1g		
C49-18	4	1	1.8g	left ulna-deer	
C64-10	3	8	3.4g		Floor
C64-13	2	1	0.7g		
Shell:					
Mollusk					
C50-20	1	6	5.1g		
C50-24	4	1	1.0g		
Gastropod					
B35-23	2	1	0.2g		
FLORAL REMAINS					
Nutshell:					
Unburned					
A4-6	2	4			
A31-10	3a	2			
B30-19	1	3			
B30-20	1	3			
B30-21	1	2			
B31-20	1	5			
B34-6	1	4			
B34-7	1	7			
B34-15	1	5			
B35-2	1	1			
B44-25	1	3			
C49-7	3	1			
C49-23	2	1			
C63-1	1	1			
Burned					
A10-4	1	1			North Terrace area
C49-15	1	1		*Quercus*	Structure 2, above floor
C49-18	4	4		*Carya*	Structure 2, below floor

Table 51. Continued

Material	Level (10 cm)	Ct.	Wt.	Identification	Feature Association
Seeds:					
Unburned					
B2-25	1	1			
C50-11	1	2			
C64-1	1	1			
C64-3	1	1			
Burned					
A20-14	2	1			F78-6
C49-15	1	1			Structure 2, above floor
C64-1	4	1		*Phytolacca*	Structure 2, below floor
C64-7	4A	1			Structure 2, floor
C64-7	4B	1			Structure 2, below floor
C64-14	Floor	1			Structure 2, floor
C64-14	2	1			Structure 2, above floor

of the deposits or from areas disturbed by brush clearing operations and are believed to be recent additions to the site.

Most charred materials occurred in deeper undisturbed deposits. Charred seeds and nuts were recovered during the excavation of Structure 2 and in the mound located at the north end of the site. The charred materials were submitted to Dr. J. L. Gentry, Professor of Botany, at the University of Oklahoma. Only *Phytolacca* (Pokeweed), *Quercus*, and *Carya* were identified. Four other seeds from Structure 2 were unidentified but may be part of the same genus. All of the identified materials are edible. No domesticated seeds were found in the small sample of charred materials.

DISCUSSION AND INTERPRETATIONS

Lithic Resource Utilization

A sample of chipped stone artifacts (Table 52) and debitage (Table 53) was sorted by lithic type to determine preferential use and differences between debitage and finished tools. This analysis was conducted to provide information concerning changes in lithic selection through time, differences between local manufacturing and maintenance patterns, and directions of external relationships.

The unmodified flake sample represents all debitage from four squares. Two squares from the north terrace area were selected to represent materials from the mound and adjacent areas. The squares from the south terrace area are deep squares excavated in areas of high flake concentrations adjacent to the structural mounds. Table 53 indicates that 99% and 100% of the unmodified flakes from the north and south areas are from locally available sources. In general, the dominant lithic types are similar in both areas. The predominant lithic type from both the north and south terrace areas is Type A (67.5% and 71.8%), followed by Type B (7.1% and 11.1%), Type J (8.0% and 8.8%), Type H (5.8% and 4.0%) and Type D (4.6% and 1.7%). The order of lithic types C, E, F, and G varies between the north and south terrace areas, but occur in small quantities. They contribute less than 6% and 3% to the total sample. The proportional differences between the two areas are not believed to be significant. While actual frequencies vary between each level the same general relationships are stratigraphically apparent within the four test squares. The occupants at 34Pu-74 were using the same general sources through time.

The selected chipped stone tool sample consists of finished implements and includes points *(01-00)*, drills *(02-00)*, wedges *(03-00)*, scrapers *(05-00)*, hoes *(07-00)*, tanged bifaces *(08-00)*, and backed bifaces *(09-00)*. Modified flakes and items from the reduction sequence were excluded from the analysis. Table 52 indicates that the proportion of tools from local cherts and quartzite (98%) is similar to the proportions noted for the flake debitage. In addition, the relationship of the four dominant stone tool lithic types are identical to that of the flake debitage, although the frequencies vary. The

Table 52. Lithic type frequencies for selected chipped stone varieties from 34Pu-74.

Artifact Variety	Lithic Type A	B	C	D	E	F	G	H	I	J	K	Total
01-01-01A	21	7	1	-	1	1	-	2	-	4	-	37
01-01-01B	-	-	1	-	-	-	-	-	-	-	-	1
01-01-01C	1	1	-	-	-	-	-	-	-	-	-	2
01-01-02A	2	-	-	-	-	-	-	2	-	-	-	4
01-01-02B	1	-	-	-	-	-	-	-	-	1	-	2
01-01-02D	9	2	-	-	-	-	-	-	-	-	-	11
01-01-02E	2	1	-	-	-	-	-	-	-	1	-	4
01-01-02H	-	1	-	-	-	-	-	1	-	-	-	2
01-01-02I	-	1	1	-	-	-	-	1	-	-	-	3
01-01-02K	1	-	-	-	-	-	-	-	-	-	-	1
01-01-02L	5	-	1	-	-	-	-	1	-	1	-	8
01-01-02M	1	1	-	-	-	-	-	-	-	2	-	4
01-01-02N	-	2	-	-	-	-	-	-	-	-	-	2
01-01-02O	1	-	-	-	-	-	-	-	-	-	-	1
01-01-02P	1	-	-	-	-	-	-	-	-	-	-	1
01-01-02Q	-	-	1	-	-	-	2	1	-	-	-	4
01-01-02S	-	1	-	-	-	-	-	1	-	1	-	3
01-01-03A	-	1	-	-	-	-	-	-	-	-	-	1
01-01-04A	5	-	-	-	-	-	-	-	-	-	-	5
01-01-04C	1	-	-	-	-	-	-	-	-	-	-	1
01-01-04D	-	1	-	-	-	-	-	-	-	-	-	1
01-01-05A	2	-	-	-	-	-	-	-	-	-	-	2
01-01-05C	-	-	-	-	-	-	-	1	-	-	-	1
01-01-06A	9	2	1	-	1	-	1	-	-	1	-	15
01-01-06B	-	1	-	-	-	-	-	-	-	1	-	2
01-01-06E	-	1	-	-	-	-	-	-	-	-	-	1
01-01-06F	-	-	-	-	1	-	-	-	-	-	-	1
01-01-06G	-	-	-	-	-	-	-	-	-	-	1	1
01-01-06H	-	-	-	-	-	-	-	-	-	-	1	1
01-01-07A	-	2	-	-	-	-	-	-	-	-	-	2
01-01-07B	-	3	-	-	-	-	-	-	-	-	-	3
01-01-07C	-	1	-	-	-	-	-	-	-	-	-	1
01-01-07D	-	-	-	-	-	-	-	-	-	-	1	1

Table 52. Continued

Artifact Variety	A	B	C	D	E	F	G	H	I	J	K	Total
					Lithic Type							
01-01-07E	1	-	-	-	-	-	-	1	-	-	-	2
01-01-08A	1	-	-	-	-	-	-	-	-	-	-	1
01-01-08C	-	-	-	-	-	-	-	-	-	1	-	1
Subtotal	64	29	6	-	3	1	3	11	-	13	3	133
%	48.1	21.8	4.5	-	2.3	.8	2.3	8.2	-	9.7	2.3	100
01-02-01B	-	-	-	-	-	-	-	1	-	-	-	1
01-02-01C	-	4	-	-	-	-	-	-	-	1	-	5
01-02-03A	4	2	-	-	-	-	-	2	-	1	-	9
01-03-01A	1	-	-	-	-	-	-	-	-	-	-	1
01-05-01A	8	-	-	-	-	-	-	-	-	-	-	8
01-07-01A	-	-	-	-	-	-	-	-	-	2	-	2
01-08-01A	1	-	-	-	-	-	-	-	-	-	-	1
01-09-01A	11	1	-	-	-	-	-	-	-	-	-	12
Subtotal	25	7	-	-	-	-	-	3	-	4	-	39
%	64.1	17.9	-	-	-	-	-	7.7	-	10.3	-	100
Total	89	36	6	-	3	1	3	14	-	17	3	172
%	51.7	21.0	3.5	-	1.7	0.6	1.7	8.1	-	10.0	1.7	100

Table 53. Lithic material type frequencies for debitage from north and south terrace areas at 34Pu-74.

Provenience (Square:Level) (10 cm)	Lithic Type A	8	C	D	E	F	G	H	I	J	K^1	K^2	Total
North Terrace													
A10-6													
1	89	26	3	9	4		2	9		15	4		161
2	82	28	5	12	11	1	5	3		9			156
3	58	8	2	5	3		4	6		3			89
4	8												8
Sub-total	237	62	10	26	18	1	11	18		27	4		414
%	57.2	14.9	2.4	6.3	4.3	0.2	2.7	4.3		6.5	1.0		99.8
A20-19													
1	192	27	8	20	7	2		28		17	3	1	305
2	316	20	9	9	5	6	2	23		22	14		426
3	185	2	2	10				13		34	1	1	248
4	161	5	1	11	5		5	12		22			222
5	11							1		4			16
Code 4	11	1						1		6			19
Sub-total	876	55	20	50	17	8	7	78		105	18	2	1,236
%	70.9	4.4	1.6	4.0	1.4	.6	.6	6.3		8.5	1.5	.2	100
Total	1,113	117	30	76	35	9	18	96		132	22	2	1,650
North Area %	67.5	7.1	1.8	4.6	2.1	.1	1.1	5.8		8.0	1.3		99.4
South Terrace													
85-25													
1	172	12	1	1		1		13		8			208
2	295	75		3	1	1	1	20		22			418
3	206	9	3	2				17		8			245
4	64	10				1		4		9			88
5	175	44		6	1		4	8		6			244
6	115	11			1	2	2	3		19			153
7	7	1											8
Sub-total	1,034	162	4	12	3	5	7	65		72			1,364
%	75.8	11.9	.3	.9	.2	.4	.5	4.8		5.3			100.1
820-8													
1	51	12	1	3		2		4		17			90
2	268	14		10	1	5	1	19		43			361
3	187	21	5	2	5			17		35			272
4	286	60	2	8		4	21			44			425
5	90	22		6	2	1		7		14			142
6	65	12		5		3				14			99
7	23	7		2				1		6			39
Code 4	3	1								1			5
Sub-total	973	149	8	36	8	15	22	48		174			1,433
%	67.9	10.4	.6	2.5	.6	1.0	1.5	3.3		12.1			99.9
Total	2,007	311	12	48	11	20	29	113		246			2,797
South Area %	71.8	11.1	.4	1.7	.4	.7	1.0	4.0		8.8			99.9

K^1 does not include 8oone chert
K^2 only includes those identified at 8oone chert

chipped stone tool proportions include Type A (51.7%), Type B (20.9%), Type J (9.9%), and Type H (8.1%). The remaining five local chipped stone lithic sources differ in sequence from the flake debitage but they constitute only 7.5% of the implements. A comparison of tool and flake debitage frequencies reveals that tools were made from substantially less Types A and D, but more from Types B, C, H, and J than reflected in the flake debitage. Two interpretations of these results are possible. First, since the chipped stone tool categories are weighted in favor of points *(01-00)*, the differences could artifically reflect the preference of Types B, C, H, and J for making points. Second, the differences could reflect actual differences in manufacturing and maintenance activities. The low counts of Types B, C, H, and J in the flake debitage could indicate that finished tools were manufactured at other sites.

Nonlocal cherts represent less than 2% of the flake debitage and tools in the sample analyzed. The only identifiable nonlocal chert type is Boone (0.2% of the flake debitage). The small amount of this type from north of the Arkansas River indicates that relatively little chert was carried into the site from the north. The amount of chert arriving from the south is uncertain since the same kinds of local chert are found throughout the Kiamichi and Red River gravels below the Jackfork River (Mallouf 1976). Probably chert was rarely carried into Jackfork Valley since it occurs in abundant quantities in the gravel deposits and surrounding mountain formations.

Intrasite Analyses

The direction of intrasite analysis is guided by several considerations. Differences in soil stratigraphy, density and nature of cultural features, and the distance between the two tested areas (80 m) inhibits direct correlation of the components. Consequently, features and materials in the north terrace area (Block A) will be examined separately from materials in the south terrace area (Blocks B, C, D, E). Furthermore, the fill matrix of the low mound in Block A and the two structural mounds in Blocks B and C are related to cultural activities. Analysis of the vertical distribution of selected artifact types to isolate the number of components and their temporal affiliations must consider differential accumulation rates of cultural deposits. Analysis of north terrace materials will contrast items from the mound and adjacent squares while the analysis of the south terrace materials will consider each structural mound separate from off-mound areas (Fig. 35). Data concerning artifact assemblages from the five areas of the site are provided in tabular form (Table 54). Vertical distribution of materials within each area is discussed in detail below. After each area has been examined separately the north and south portions of the site will be contrasted in an attempt to make cultural correlations.

The isolation and definition of components at 34Pu-74 is partially hampered by conflicting radiocarbon dates and by the use of arbitrary excavation units which may mask stratigraphic differences. Nevertheless,

Table 54. Horizontal distribution of cultural remains from 34Pu-74.

Artifact Variety	Surface	North Area: Mound	North Area: Off Mound	South Area: Off Mound	South Area: Structure 1	South Area: Structure 2	Total
01-01-01A	3	12	4	2	2	14	37
01-01-01B					1		1
01-01-01C			1	1			2
01-01-02A				1		3	4
01-01-02B					2		2
01-01-020			1	2	2	6	11
01-01-02E						4	4
01-01-02H					1	1	2
01-01-02I				2	1		3
01-01-02K					1		1
01-01-02L				2	1	5	8
01-01-02M				1	1	2	4
01-01-02N				2			2
01-01-020		1					1
01-01-02P	1						1
01-01-02Q				2		2	4
01-01-02S		1			1	1	3
01-01-03A				1			1
01-01-04A		1	1		2	1	5
01-01-04C				1			1
01-01-040			1				1
01-01-05A		2					2
01-01-05C	1						1
01-01-06A		1	1	2	9	2	15
01-01-06B						2	2
01-01-06E						1	1
01-01-06F					1		1
01-01-06G				1			1
01-01-06H			1				1
01-01-07A						2	2
01-01-07B	1	1			1		3
01-01-07C					1		1
01-01-070					1		1
01-01-07E					2		2
01-01-08B	1						1
01-01-08C					1		1
01-02-01B				1			1
01-02-01C		1	2		1	1	5
01-02-03A		1	1	1	4	2	9
01-03-01A			1				1
01-05-01A		1	4		1	2	8
01-07-01A			1		1		2
01-08-01A						1	1
01-09-01A	1			1	3	7	12
01-10-01A		2	9	13	12	25	61
01-10-02A	7	33	31	56	70	113	310
01-10-03A		11	9	21	20	51	112
01-10-04A-L		1	1	6	4	8	20
01-10-04A-S		3		1	5	3	12
01-10-05A-L		1	2	2	4	4	13
01-10-05- S				3	1	3	7
01-11-01A						2	2
01-12-01A-L	3	30	17	25	42	74	191
01-12-01A-S			2	4	6	7	19
01-13-01A	2	3	5		16		26
01-13-01B	10	35	57	8	7	146	263
01-13-01C						6	6
01-14-01A		1			1	4	6

Table 54. Continued

Artifact Variety	Surface	North Area: Mound	North Area: Off Mound	South Area: Off Mound	South Area: Structure 1	South Area: Structure 2	Total
01-15-01A			2	3	5	4	14
01-15-02A	1	3	10	6	9	13	42
01-16-01A*	424	9,142	9,776	11,624	16,571	29,983	77,520
01-16-02A		4	1	5	9	8	27
02-01-01A					4	11	15
02-01-010					1		1
02-01-02A					3	10	13
02-01-02B				1		1	2
02-01-02C						1	1
02-01-03A		4				14	18
02-02-01A						1	1
03-01-01A		2		1		4	7
03-01-02A	3			2	1	4	10
03-01-03A				1			1
03-01-04A						1	1
03-02-01A					2	1	3
03-03-01A				1			1
03-04-01A						1	1
03-06-01A					1	1	2
03-06-02A					1	3	4
04-01-01A					1		1
04-02-01A	2				1	4	7
04-02-02A						2	2
04-03-01A	1	1			2	1	5
04-04-02A			1				1
04-04-03A						1	1
04-04-04A					1		1
07-03-04A					1		1
07-03-05A			2				2
07-03-06A			1				1
07-03-08A					1		1
07-03-09A				1			1
07-04-01A			26				26
Artifact Totals	37	154	197	182	257	610	1,437
Number of Levels Excavated		36.5	64.1	44.5	154.5	149	
Artifact CI		4.2	3.1	4.1	1.7	4.1	
Flake Total		9,142	9,776	11,624	16,571	29,983	
Flake CI		250.5	152.5	261.2	107.3	201.2	

L indicates large artifacts of a particular variety
S indicates small artifacts of a particular variety
* unmodified flake tally not included in totals

provisional components can be identified by stratigraphically segregating artifact assemblages. Generally, assemblage segregation can best be accomplished in those portions of the site with the deepest deposits.

NORTH TERRACE AREA

Depositional differences are apparent between the low mound and adjacent squares in the northern part of the site. The low mound contained a series of stratigraphically superimposed features and the depth of cultural materials, as indicated by unmodified flake debitage, extended to 60 cm. In contrast, superimposed features were not encountered adjacent to the mound and unmodified debitage was compressed within the upper 40 cm of the solum (Table 55). Not only are the cultural deposits in areas adjacent to the mound shallower, but they generally contain less material. A comparison of concentration indices (CI) of flakes calculated for each level reveal that Levels 1 through 5 on the mound have a density in excess of 100 flakes, while similar densities were confined to the upper two levels in squares adjacent to the mound. These data suggest that assemblage segregations should initially be conducted on materials from the mound, and later expanded to the adjacent area.

North Terrace Mound

Materials from the north area mound were obtained from the excavation of nine contiguous full and five contiguous half squares. These squares were excavated to expose feature relationships within the mound and only two squares (A20-16 and 20-19) were excavated to culturally sterile soil. Materials from the lower deposits are poorly represented in the sample from the mound.

One hundred fifty bifaces, bifacial implements, and modified flakes *(01-13-00)*, four ceramic sherds *(02-01-00)*, and 9142 unmodified flakes *(01-16-00)*, were recovered from the 65 cm deep deposits. An examination of the vertical distribution of artifacts indicates that contracting stemmed points *(01-01-01A)*, cobble/block biface II/thick bifaces *(01-10-02A)*, large point/biface fragments and segments *(01-12-01)*, and modified flakes *(01-13-01B)* occur throughout the deposits (Table 56). However, other diagnostic tool forms (points: *01-01-00*; drills: *01-02-00*; ceramics: *02-01-00*; and pecked stone implements: *04-03-01A*) are restricted to specific levels. This suggests that the basic assemblage is additive and not subject to wholesale replacement. Thus the relative frequencies of tools, rather than mere presence-absence of types will be important in isolating assemblages. An examination of tool forms which are vertically restricted indicates that most occur in low frequencies and may be subject to biases inherent in small samples. Furthermore, many large point styles were manufactured during several millenia and some span several cultural stages (Bell 1958; 1960; Perino 1968; 1971). Thus single examples of most

Table 55. Comparison of the vertical distribution of lithic debitage in the north terrace area of 34Pu-74 by concentration indices.*

Provenience (Level: 10 cm)	Number of Squares	Number of Flakes	CI
North Area Mound Level:			
1	11.5	2975	258.7
2	10.0	2631	263.1
3	7.5	2424	323.2
4	3.0	694	231.3
5	3.0	310	103.3
6	2.0	106	53.0
7	0.5	2	4.0
North Area Adjacent to Mound Level:			
1	21.0	3690	175.7
2	21.0	4815	229.3
3	15.0	1161	77.4
4	6.0	110	18.3
5	1.25	0	0

*Concentration Indices (CI) = $\frac{\text{Total flakes per level}}{\text{Number of squares per level}}$

Table 56. Vertical distribution of artifacts and debitage from the north terrace mound at 34Pu-74.

Artifact[1] Variety	Arbitrary Levels (10 cm) 1	2	3	4	5	6	7	Total
01-01-01A	3	4	3	1	-	1	-	12
01-01-020	-	-	-	1	-	-	-	1
01-01-02S	1	-	-	-	-	-	-	1
01-01-04A	-	-	-	1	-	-	-	1
01-01-05A	-	1	-	1	-	-	-	2
01-01-06A	1	-	-	-	-	-	-	1
01-01-07B	1	-	-	-	-	-	-	1
01-02-01C	1	-	-	-	-	-	-	1
01-02-03A	-	-	1	-	-	-	-	1
01-05-01A	-	1	-	-	-	-	-	1
01-10-01A	-	1	1	-	-	-	-	2
01-10-02A	8	7	10	3	5	-	-	33
01-10-03A	1	8	2	-	-	-	-	11
01-10-04A-*L*	-	1	-	-	-	-	-	1
01-10-04A-*S*	1	1	-	1	-	-	-	3
01-10-05A-*L*	1	-	-	-	-	-	-	1
01-12-01A-*L*	9	8	8	3	1	1	-	30
01-13-01A	-	1	2	-	-	-	-	3
01-13-01B	7	13	8	-	6	1	-	35
01-14-01A	-	-	-	-	1	-	-	1
01-15-02A	-	-	1	1	1	-	-	3
01-16-02A	-	2	1	1	-	-	-	4
02-01-03A	-	2	2	-	-	-	-	4
04-03-01A	-	-	1	-	-	-	-	1
Total	34	50	40	13	14	3	-	154
Number of Levels Excavated	11.5	10	7.5	3	3	2	.5	
CI	3.0	5.0	5.3	4.3	4.7	1.5	-	

[1]*L* indicates large artifacts of a particular variety
S indicates small artifacts of a particular variety

large point styles provide little indication of the age of the deposit, number of components, and rate of mound accumulation.

Some distributional differences are apparent, however. The upper three levels contain shell tempered sherds *(02-01-03A)*, pecked stone artifacts *(04-03-01A)*, scrapers *(01-05-01A)*, drill fragments *(01-02-03A)*, small points *(01-01-06A* and *01-01-07B)*, and most of the small thin bifaces *(01-10-04A)*. The lower four levels contain large points reminiscent of *Carrollton (01-01-04A)* and *Snyder (01-01-020)* types, and split cobble sections *(01-14-01A)*. Of considerable interest is the distribution of *Dalton* points *(01-01-05A)*. This Early Archaic point form occurs in Levels 2 and 4 in direct association with later *Gary (01-01-01A)*, *Snyder (01-01-020)*, and *Carrollton (01-01-04A)* point types. The occurrence of *Daltons (01-10-05A)* in the mound fill probably reflects artifact reuse rather than an actual Early Archaic occupation at the site.

Additional stratigraphic differences are apparent from the water-screen residue sorted from the mound. These data, provided in Table 57, represent sorting of 1000 g samples from all 5 cm levels in the control square, A20-16. All figures have been adjusted to 500 g sample weights to make them comparable to residue sorts from the south terrace area at 34Pu-74 and other sites. Results from waterscreening indicate that organic materials are poorly preserved. Presumably the poor preservation may be attributed to soil acidity and the wet and dry cycles of the region.

A comparison of flake counts and weights expressed as average flake weight per level indicates some vertical distinctions reflecting flake size. The general trend shows a decrease in average flake weight from the surface to the bottom of the mound. Waterscreen Levels 2 through 8 (5-40 cm) have average flake weights ranging from .0275 g to .0385 g, with the exception of Level 4 (15-20 cm) which has an average weight of .0098 g. The lower levels of the mound have an average weight ranging from .0148 g to .0227 g.

The small flake size (as expressed by lower average weights) is believed to reflect tool maintenance activities while the larger flakes reflect tool manufacturing activities. In reference to the 10 cm excavation units, this means that the activities conducted in Levels 5, 6, and 7 relate to more tool resharpening. The upper levels, with the exception of Level 2, reflect an increase in tool manufacturing activities.

These interpretations have implications concerning activities associated with mound origin and development. The scattered nature of the lower horizontal rock features (F78-3 and 78-10) in the mound area have been interpreted as secondary depositions since the matrix surrounding the rocks was not oxidized and associated charcoal was scarce. One hypothesis to explain this may be that the entire mound resulted from habitual dumping of trash, rocks, ashy loam, floral and faunal materials, broken and discarded tools, and waste debris. The separate rock features could then be interpreted as the result of different clearing and dumping episodes from activities conducted at some other area of the site. The accumulation of a 68 cm mound of material could conceivably occur during a relatively short

Table 57. Counts and weights of waterscreened sorts of selected arbitrary levels from squares A20-16 and B34-5 at 34Pu-74.

Provenience (Square:Level) (5 cm)	Sample Wt.	Gravel Wt.	Flakes Ct.	Flakes Wt.	$\bar{X}$ Flake Wt.	Charcoal Wt.	Nutshell Wt.	Seeds/ Seed Parts Ct.	Seeds/ Seed Parts Wt.	Bone Wt.	Shell Wt.	Miscel-laneous Wt.	Strati-graphic Unit
North Mound Area													
A20-16:													
1*	500g	405.9g	160	13.7g	.0856g	0.8g	-	136	3.8g	<0.1g	-	75.8g	I
2*	500g	485.7g	213	8.2g	.0385g	0.5g	-	58	0.2g	<0.1g	<0.1g	5.4g	I
3*	500g	486.4g	258	8.7g	.0337g	0.5g	-	17	0.1g	-	-	4.3g	I
4*	500g	473.6g	234	2.3g	.0098g	2.3g	-	17	<0.1g	-	-	21.8g	I/II
5*	500g	477.5g	267	9.8g	.0367g	1.2g	-	2	<0.1g	-	-	11.5g	II
6*	500g	471.6g	513	16.9g	.0329g	2.3g	0.1g	10	0.2g	-	-	8.9g	II
7*	500g	477.0g	422	15.4g	.0365g	0.9g	-	19	0.1g	-	-	6.6g	II
8*	500g	484.4g	440	12.1g	.0275g	0.8g	-	12	0.1g	-	-	2.6g	II
9*	500g	483.1g	625	13.9g	.0222g	0.4g	0.1g	9	0.1g	-	-	2.4g	II/III
10*	500g	479.2g	818	15.0g	.0183g	0.3g	0.2g	31	0.2g	-	-	5.1g	III
11*	500g	490.2g	309	6.4g	.0207g	0.2g	<0.1g	8	0.1g	-	-	3.1g	III
12*	500g	488.1g	145	2.2g	.0148g	0.3g	-	5	<0.1g	-	-	9.4g	III
13*	500g	493.1g	150	3.4g	.0227g	0.1g	-	6	<0.1g	-	-	23.4g	III/IV
Structure 1: Mound Area													
B34-5:													
1*	500g	470.6g	363	4.7g	.0129g	0.3g	-	56	0.1g	-	<0.1g	24.3g	I
2	500g	481.4g	527	6.9g	.0130g	3.4g	0.3g	17	<0.1g	<0.1g	-	8.0g	I
5	500g	473.5g	673	10.6g	.0157g	4.5g	0.1g	25	0.1g	<0.1g	-	11.2g	Ash
7	500g	485.4g	329	4.5g	.0137g	2.5g	<0.1g	11	<0.1g	-	-	7.6g	Roof Fall
8	500g	492.5g	388	5.4g	.0139g	1.0g	<0.1g	6	<0.1g	-	<0.1g	1.1g	Floor
11	500g	494.5g	223	5.4g	.0242g	< 0.1g	-	-	-	<0.1g	-	0.1g	III
18	500g	497.1g	250	2.7g	.0108g	< 0.1g	-	-	-	-	-	0.2g	III

* indicates 1000g sample analyzed; figures adjusted to 500g units.

Wt. indicates weight.

Ct. indicates count.

archaeological interval. However, evidence for tool maintenance activities in the lower and middle portions of the mound along with a pit (F78-8) and rock hearths (F78-6 and 78-9) in primary context within the middle and upper matrix clearly indicates that processing activities also occurred on the mound. Insights into some of the activities conducted during the mound growth can be gained by correlating the stratigraphy and features with differences noted in the artifact assemblage and waterscreen residue sorts.

It is difficult to determine when the north terrace mound area was first occupied. Culturally diagnostic materials associated with the lowest portion of Stratum III have not been recovered. Stratigraphy indicates that a natural mound was present, but it was considerably lower than the present mound. Better drainage may have been one consideration for the selection of this portion of the terrace. Little is known about the activities conducted in this area. However, during the deposition of Stratum III, the people were using large contracting stemmed *(Gary)* points *(01-01-01A)*. The scarcity in Levels 6 and 7 of cobble bifaces *(01-10-01A* and *01-10-02A)*, thin biface I's *(01-10-03A)*, and the relatively small size of flake debitage *(01-16-00)* suggests that tool maintenance rather than manufacturing was being stressed. Some kind of processing activities are suspected. No cultural features have been found in the lower portion of Stratum III. This may reflect the limited testing of these deposits.

Several differences are noted near the transition of Strata III and II. Although flake debitage *(01-16-00)* continues to be small, the amount of early procurement *(01-15-02A)* and initial modification *(01-10-01A, 01-10-02A,* and *01-14-01A)* stage bifaces and cores *(01-14-01A)* drastically increase. Yet the primary and secondary manufacturing stages *(01-10-03A, 01-10-04A,* and *01-10-05A)* are poorly represented. This may reflect an increase in tool manufacturing activities. Also, one horizontal rock concentration (F78-3) is widely scattered across the mound area. The rocks in this feature show signs of thermal alteration and there is a slight increase in charcoal and nutshell in the waterscreen residue from approximately the same level. The surrounding matrix shows no clear evidence for oxidation. It is uncertain whether this feature (78-3) is in primary context. The diagnostic tools associated with the feature may possibly include a contracting stemmed point *(01-01-01A)*, modified flakes *(01-13-01B)*, large biface/point fragments and segments *(01-12-01A)*, and thick bifaces *(01-10-02A)* from the early stages of lithic reduction.

The lower portion of Stratum II between rock features 78-3 and 78-10 continues to display relatively small flake debitage indicative of tool maintenance activities along with a continuation of bifaces from the early cobble procurement *(01-15-02A)* and initial tool manufacturing *(01-10-02A)* stage. In addition to *Gary* points *(01-01-01A)*, the large point styles from the lower portion of Stratum II include occasional *Snyder (01-01-02)* and *Carrollton (01-01-04A)* types. The residue sort reveals a decrease in charcoal and nutshell fragments in the matrix immediately above Feature 78-3.

Several changes in soil content and maunfacturing debris are apparent in the upper Stratum II matrix within the mound area. The deposition of a scattered horizontal rock feature (F78-10) marks the transition. Some rocks in this feature are burned but the matrix displays no color change indicative of oxidation in a primary context. Nevertheless, associated with this feature are occasional baked clay and ash nodules and slightly increased amounts of charcoal and burned nutshells. Clearly, burning is associated with the rocks but it is uncertain whether the soil matrix is in a primary association or that rocks and associated matrix were dumped onto the mound from activities conducted elsewhere. An increase in the number of initial manufacturing stage bifaces *(01-10-01A* and *01-10-02A)* along with the earliest occurrence in the mound area of primary manufacturing stage bifaces *(01-10-03A)*, large point/biface fragments *(01-12-01A)*, and the larger size of flakes indicates an increased emphasis on tool manufacturing. Artifacts within the upper portion of Stratum II consist exclusively of *Gary* points *(01-01-01A)*, drill fragments *(01-02-03A)*, and pecked stone artifacts *(04-03-01A)*.

The transition from Stratum II to Stratum I is marked by potentially significant changes in the kinds and types of artifacts, features, and activities. Small point preforms *(01-10-04A)*, scrapers *(01-05-01A)*, and shell tempered ceramics *(02-01-03A)* first appear in the mound deposits in association with *Gary (01-01-01A)* and *Dalton (01-01-05A)* points and modified flakes *(01-13-01B)*. The orifice of one pit (F78-8) is correlated with this transitional zone. Although the contents of the pit lacked diagnostic materials, extremely small flake debris was recovered from the waterscreen residue sorts of a comparable adjacent level. Extensive tool maintenance was conducted around the pit feature area. The fill over the pit contained significantly larger flakes and numerous bifaces reflecting initial *(01-10-01A* and *01-10-02A)*, primary *(01-10-03A)*, and secondary *(01-10-04A* and *01-10-05A)* stages in the reduction sequence and segments from bifaces and points *(01-12-01A)*.

The upper portion of Stratum I contained most of the small points *(01-01-06A* and *01-01-07B)* and small point preforms *(01-10-04A)* in association with large contracting stemmed *(01-01-01A)* and large corner-notched *(01-01-02)* point forms. The abundance of bifaces representing initial *(01-10-01A* and *01-10-02A)*, primary *(01-10-03A)* and secondary *(01-10-04A* and *01-10-05A)* stages of manufacturing, large biface/point fragments *(01-12-01A)*, and large flake debris indicate that tool manufacturing was occurring near the top of the mound.

An unknown amount of the upper portion of Stratum I was disturbed and removed during earlier brush clearing operations. These activities may have also removed the tops of two rock hearths (F78-6 and 78-9) located in the uppermost portion of Stratum I. Although no culturally diagnostic materials were recovered from the hearths, stratigraphically they are the most recent cultural features on the mound. Their relationship to Stratum I is uncertain because of the unknown amount of disturbance which occurred on the north terrace area.

North Terrace Areas Adjacent to the Mound

Materials from areas adjacent to the north terrace mound were obtained from the excavation of 21 full squares. With the exception of nine squares southwest of the mound area excavated to expose Feature 78-2, none of the squares are contiguous. Cultural deposits extend to a maximum depth of 40 cm. The horizontal distribution of average flake density by square reveals that the greatest concentration of materials is located southwest of the mound area (Fig. 48). This area has experienced the least disturbance during the brush clearing operations and presumably the concentration extends beyond the limits of Block A. The areas north and east of the mound have suffered considerably more from brush clearing activities as indicated by the number and extent of piled earthen mounds containing burned stumps. Materials from squares in these areas may be mixed.

Three groundstone artifacts *(03)*, 165 chipped stone artifacts *(01)*, 29 historic specimens *(07)*, and 9776 unmodified flakes *(01-16-00)* were recovered from the north terrace squares adjacent to the mound. Diagnostic materials are confined to the upper three levels (Table 58).

Both horizontal and vertical components become important in attempting to isolate artifact assemblages in non-contiguous tested areas. For example, the disturbed nature of the deposits in the north terrace area is indicated by the recovery of plastic jug fragments *(07-04-01A)* from the same depth (Level 3) as a small expanding stemmed/corner-notched *(Scallorn)* point *(01-01-06A)* and large straight stemmed *(Bulverde)* points *(01-01-04D)*. The plastic fragments and the *Scallorn* point are from the disturbed areas to the east and north of the mound, respectively. The *Bulverde* point occurred beneath a rock feature (F78-2) southwest of the mound. Consequently, less emphasis is placed on the vertical distribution of materials from the disturbed areas north and east of the mound than those areas to the southwest.

Diagnostic materials from the disturbed area of the site include the plastic jug fragments *(07-04-01A)*, a *Scallorn* point *(01-01-06A)*, two scapers *(01-05-01A)*, and a belemite fossil*(04-04-01B)* from Level 3; a *Gary* point *(01-01-01A)*, a drill fragment *(01-02-03A)*, and two scrapers *(01-05-01A)* from Level 2; and two small unnamed points *(01-01-01C* and *01-01-06H)*, a wedge *(01-03-01A)*, and a hoe fragment *(01-07-01A)* from Level 1. A *Travis* point *(01-01-02P)* was also recovered from the surface of the disturbed area. These items will not be considered in further analysis of north terrace materials.

The following discussion of the vertical distribution of diagnostic artifacts is concerned only with materials from the area southwest of the mound where little disturbance is believed to have occurred. These materials occurring in the nine contiguous squares containing Feature 78-2 and random squares A4-6 and 3-7 are examined.

No features have been found in the lowest cultural stratum (III) in areas adjacent to the mound. Associated diagnostic artifacts include *Gary* (01-01-01A), *Bulverde (01-01-04D)*, and *Frio (01-01-02D)* points; drill

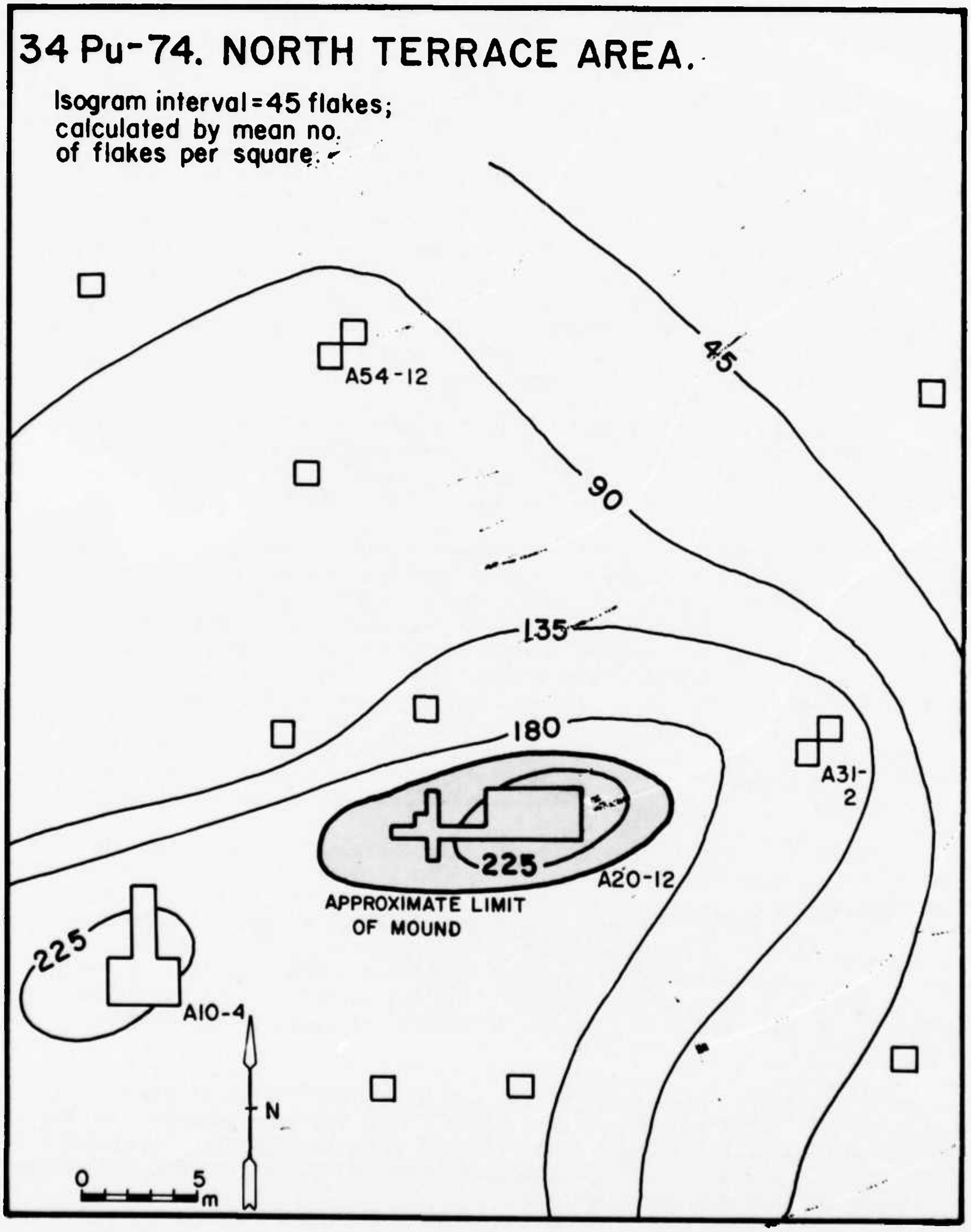


Fig. 48. Isograms showing lithic debitage concentration indices in North Terrace Area of the Blessingame site (34Pu-74).

Table 58. Vertical distribution of artifacts and debitage from north terrace areas adjacent to the mound at 34Pu-74.

Artifact[1] Variety	Arbitrary Levels (10 cm) 1	2	3	4	5	Code 4 Wall Scraping	Total
01-01-01A	1	3	-	-	-	-	4
01-01-01C	1	-	-	-	-	-	1
01-01-02D	-	1	-	-	-	-	1
01-01-04A	1	-	-	-	-	-	1
01-01-04D	-	-	1	-	-	-	1
01-01-06A	-	-	1	-	-	-	1
01-01-06H	1	-	-	-	-	-	1
01-02-01C	1	1	-	-	-	-	2
01-02-03A	-	1	-	-	-	-	1
01-03-01A	1	-	-	-	-	-	1
01-05-01A	-	2	2	-	-	-	4
01-07-01A	1	-	-	-	-	-	1
01-10-01A	5	3	1	-	-	-	9
01-10-02A	10	15	4	-	1	1	31
01-10-03A	3	3	2	1	-	-	9
01-10-04A-*L*	-	1	-	-	-	-	1
01-10-05A-*L*	1	1	-	-	-	-	2
01-12-01A-*L*	8	8	-	-	1	-	17
01-12-01A-*S*	1	1	-	-	-	-	2
01-13-01A	3	1	-	-	-	1	5
01-13-01B	30	17	9	-	-	1	57
01-15-01A	-	2	-	-	-	-	2
01-15-02A	4	4	2	-	-	-	10
01-16-02A	1	-	-	-	-	-	1
03-01-01A	1	-	-	-	-	1	2
04-04-02A	-	-	1	-	-	-	1
07-03-05A	2	-	-	-	-	-	2
07-03-06A	1	-	-	-	-	-	1
07-04-01A	26	-	-	-	-	-	26
Total	77	64	49	2	1	4	197
Number of Levels Excavated	21	21	15	6	1.25	-	-
CI	3.6	3.0	3.3	0.3	0.9	-	-

[1]*L* indicates large artifacts of a particular variety
S indicates small artifacts of a particular variety

fragments *(01-02-01C)*; bifaces representing the lithic reduction sequence *(01-10-01A, 01-10-02A*, and *01-10-03A)*, small point fragments *(01-12-01A)*, large fragments of points or bifaces *(01-12-01A)*, modified flakes *(01-13-01B)*, and a mano *(03-01-01A)*. Functional interpretations of these artifact classes suggest that faunal, limited floral resource processing, and chipped stone tool manufacturing were being conducted in the area southwest of the mound (House 1975; Winters 1969; Fowler 1959; Galm and Flynn 1978).

A horizontal rock concentration (F78-2) was deposited on top of Stratum III and within the lower portion of Stratum II. The function of this feature is uncertain. Some rocks appear to be thermally altered yet the absence of charcoal and oxidized soil surrounding the feature suggest that they are in a secondary depositional context. Artifacts associated with the feature include a *Carrollton* point *(01-01-04A)*, a large drill *(01-02-01C)*, modified flakes *(01-13-01B)*, bifaces representing stages in tool manufacturing *(01-10-01A, 01-10-02A, 01-10-03A*, and *01-10-04A)*, and biface/point fragments and segments *(01-12-01A)*. Perhaps these items were also redeposited from elsewhere on the site.

No prehistoric materials were recovered from Stratum II above the rock feature or in A3-7 and 4-6. However, a .22 calibre cartridge and two segments of barbed wire were recovered above Feature 78-2. These historic items are not inconsistent with the known historic activities conducted on the site. As previously indicated, Stratum I is restricted to the mound area and does not extend into the adjacent areas under consideration.

North Terrace Area Comparisons

Attempts to correlate the mound with off mound deposits in the north terrace area is hampered by the absence of temporally sensitive artifact varieties, the overall low frequency of diagnostic artifacts in both areas, the shallow and slightly different off-mound deposits, and by the extensive area disturbed by brush clearing operations.

A tabular comparison of artifacts from the two areas has previously been provided (Table 54). The list of shared items is more extensive than the list of artifacts unique to each area. An examination of Table 54 reveals that the point types common to both areas include *Scallorn (01-01-06A)*, *Gary (01-01-01A)*, and *Carrollton (01-01-04A)*. Other diagnostic artifacts found on and adjacent to the mound include drills *(01-02-01A* and *01-02-03A)*, scrapers *(01-05-01A)*, various stages in the reduction sequence *(01-10-01A, 01-10-02A*, and *01-10-03A)*, modified flakes *(01-13-01A)*, and large and small biface/point fragments and segments *(01-12-01A)*.

Items unique to the mound area include ceramics *(02-01-03A)*, *Washita* points *(01-01-07B)*, large unnamed corner-notched points *(01-01-02O* and *01-01-02S)*, *Dalton* points *(01-01-05A)*, and miscellaneous pecked/battered/unmodified cobbles *(04-03-01A)*. The list of items found only in areas adjacent to the mound includes *Frio (01-01-02D)* and *Bulverde (01-01-04D)* points, a possible hoe *(01-07-01A)*, and manos *(03-01-01B)*. Differences

between these areas are not considered to be significant. The mound areas yielded pottery *(02-01-00)* and small side-notched points *(01-07-00)* while adjacent areas have ground stone manos *(03-01-00)*.

It is not possible to confidently draw correlations between features in the mound and adjacent areas. However, some relationship may tentatively exist between Features 78-10 in the mound area and 78-2 in the adjacent area. Both features are similar in composition of low grade chert nodules, the nature of the surrounding soil matrix, the kinds of associated artifacts, and their stratigraphic position (at the bottom of Stratum II). Despite these similarities, the nature of their relationship is uncertain since they may be temporally and functionally different.

SOUTH TERRACE AREA

Depositional differences are also apparent in cultural strata at the south end of the terrace. The structural mounds are believed to have accelerated rates of accumulation during and immediately following the use of the structures. This belief is substantiated by comparing concentration indicies (CI) of flake debitage calculated by level for the two structural mounds and adjacent squares (Table 59). The CI for Level 10 within Structure 1 is considerably higher (87.0) than the CI for Level 8 in adjacent squares (13.0). A flake CI comparable to Level 10 within the structural mound is from Level 6 in the adjacent squares. The differences in depth of cultural deposits between the structural mounds and adjacent areas relates to differential ground surface relief. The mound associated with Structure 1 is 65 cm higher than the surrounding area and the mound with Structure 2 is 55 cm higher.

The low CI value from the bottom levels of squares adjacent to the mounds suggests that culturally sterile deposits were nearly encountered. Furthermore, no major "short term episodic" depositional events comparable to the structure burning and ash deposition have been recognized in these same areas. Therefore, the areas best reflecting the whole occupational sequence of the south terrace are those adjacent to the mounds. The organization of the south terrace analysis will consider these areas prior to each of the structural mounds.

South Terrace Areas Adjacent to the Structural Mounds

Material from the south terrace areas adjacent to the mounds was obtained from the excavation of eleven complete and three half squares in Block B and one square each in Blocks C and E. The complete squares were excavated to culturally sterile soil, but the three half squares were employed to partially expose Feature 78-11. Cultural deposits in the southern part of Block B are generally deeper and contain more materials than squares in the north part of the block (Fig. 49). The low density of materials in the northern part of Block B suggests that the

Table 59. Comparison of the vertical distribution of lithic debitage from structural mounds and adjacent areas by concentration indices.*

Provenience (Level: 10cm)	Number of Squares	Number of Flakes	CI
Blocks B, C, and E			
Level			
1	14.5	1914	132.0
2	14.5	2702	186.3
3	14.5	2490	171.7
4	13.0	2055	223.0
5	11.0	1590	144.5
6	9.0	618	68.8
7	6.0	229	38.2
8	2.0	26	13.0
Structure 1			
Level			
1	43.0	4325	100.6
2	43.0	4561	106.1
3	43.0	4691	109.1
4	4.5	602	133.8
4 (floor)	6.0	253	42.2
5	3.0	508	169.3
5 (floor)	6.0	982	163.7
6	2.0	212	106.0
7	1.0	103	103.0
8	1.0	144	144.0
9	1.0	103	103.0
10	1.0	87	87.0
Structure 2			
Level			
1	42.0	7579	180.5
2	42.0	7436	177.1
3	14.5	4005	276.2
3A	19.5	1394	71.4
3B	19.5	2398	123.0
4	31.0	7171	231.3

*Concentration Indices (CI) = $\frac{\text{Total flakes per level}}{\text{Number of squares per level}}$

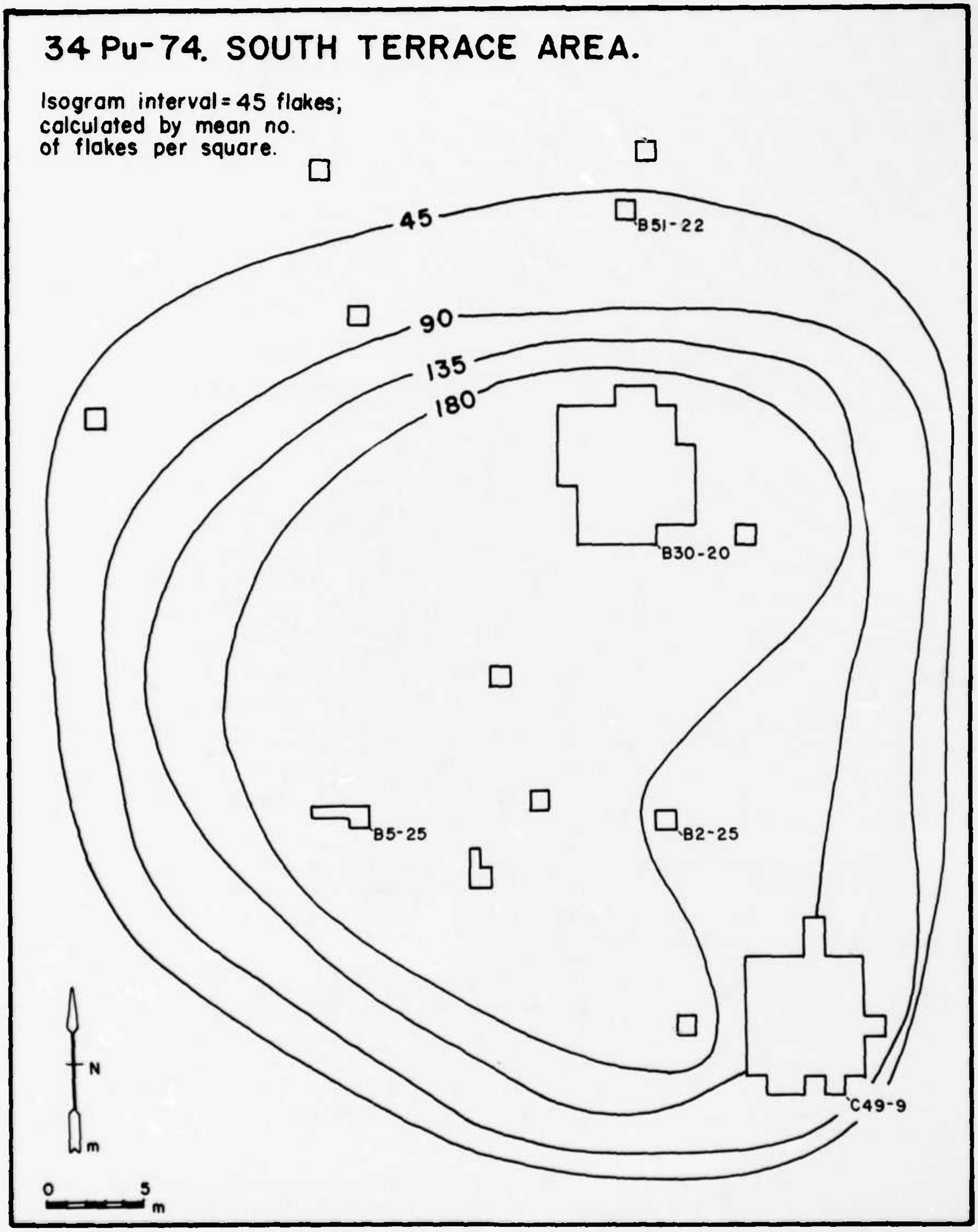


Fig. 49. Isograms showing lithic debitage concentration indices in South Terrace Area of the Blessingame site (34Pu-74).

north end of the terrace (Block A) represents a separate activity locus which may not always have been occupied during the same periods as the south end of the terrace.

One potsherd *(02-00)*, 176 chipped stone artifacts *(01-00)*, four ground stone artifacts *(03-00)*, one historic artifact *(07-00)*, and 11,624 unmodified flakes *(01-16-01)* were recovered during the test excavations of this area. Diagnostic materials are confined to the upper six levels (Table 60). Although bifaces representing stages of the reduction sequence *(01-10-01A, 01-10-02A,* and *01-10-03A)* occur throughout the levels, most diagnostic points, chipped and ground stone tools, and ceramics appear to have a restricted distribution and occur in low frequencies. Even *Gary* points *(01-01-01A)*, which were plentiful throughout the north terrace deposits, are relatively scarce and restricted to the upper-most level in the south terrace squares adjacent to the structural mounds. In most instances, vertically restricted artifact types can be correlated with previously described stratigraphic units within the south terrace area.

No cultural features have been found in the lowest culture bearing stratum (IV) in the south terrace area. Diagnostic materials associated with the early occupation include unnamed varieties of large corner-notched *(01-01-02Q)*, large side-notched *(01-01-03A)* and large straight stemmed points *(01-01-04C)*, numerous tested cobbles and bifaces from all stages of the reduction sequence *(01-10-01A, 01-10-02A, 01-10-03A, 01-10-04A, 01-10-05A,* and *01-15-02A)*, modified flakes *(01-13-01B)*, and a faceted mano *(03-01-03A)*. A small point *(01-01-06G)* was also recovered from the lower cultural deposits. This specimen is relatively thick and does not conform to previously defined point types. The placement of this specimen in the small point category is provisional and primarily based on length characteristics. It is believed to represent a small variant of *Frio (01-01-02D)* or *Darl (01-01-02M)* point. The suggested activities conducted in the lowest cultural strata reflect faunal and limited floral processing and stone tool manufacturing emphasizing initial tool manufacturing.

Features were not encountered in the lower portion of Stratum III. The presence of bifaces from the reduction sequences *(01-10-01A, 01-10-02A, 01-10-03A,* and *01-10-05A)*, indicates that tool manufacturing was still emphasizing initial modification. Diagnostic artifacts from this stratum include *Williams (01-01-02N)* and *Scallorn* points *(01-01-06A)*. In the upper portion of Stratum III, an extensive horizontal rock feature (78-11) was partially exposed in the southern portion of Block B. The function of this feature is uncertain although many of the rocks appear to be thermally altered. Two manos *(03-01-02A)* and a large biface *(01-10-02A)* were found near the bottom of the rock pile. Other artifacts possibly associated with the feature include *Frio (01-01-02D)*, *Fairland/Edgewood (01-01-02L)*, and *Darl (01-01-02M)* points.

A second rock feature (78-22) was partially exposed in the lower levels of Stratum II near the northeast corner of Block B. The rocks in this feature were also thermally altered but were not packed as densely as the rocks in Feature 78-11. No diagnostic artifacts were associated with this feature.

Table 60. Vertical distribution of artifacts and debitage from south terrace areas adjacent to structures at 34Pu-74.

Artifact Variety[1]	Arbitrary Levels (10 cm) 1	2	3	4	5	6	7	8	Code 4 Wall Scraping	Total
01-01-01A	2	-	-	-	-	-	-	-	-	2
01-01-01C	1	-	-	-	-	-	-	-	-	1
01-01-02A	-	-	1	-	-	-	-	-	-	1
01-01-02D	-	-	2	-	-	-	-	-	-	2
01-01-02I	-	1	1	-	-	-	-	-	-	2
01-01-02L	-	-	2	-	-	-	-	-	-	2
01-01-02M	-	-	-	1	-	-	-	-	-	1
01-01-02N	-	1	-	1	-	-	-	-	-	2
01-01-02Q	1	-	-	-	-	1	-	-	-	2
01-01-03A	-	-	-	-	-	1	-	-	-	1
01-01-04C	-	-	-	-	1	-	-	-	-	1
01-01-06A	-	-	-	1	-	-	-	-	-	2
01-01-06G	-	-	-	-	1	-	-	-	-	1
01-02-01B	1	-	-	-	-	-	-	-	-	1
01-02-03A	-	1	-	-	-	-	-	-	-	1
01-09-01A	-	-	1	-	-	-	-	-	-	1
01-10-01A	1	1	1	5	3	2	-	-	-	13
01-10-02A	2	14	9	14	13	4	-	-	-	56
01-10-03A	5	3	5	4	2	2	-	-	-	21
01-10-04A-*L*	-	1	-	-	3	-	2	-	-	6
01-10-04A-*S*	1	-	-	-	-	-	-	-	-	1
01-10-05A-*L*	-	1	-	1	-	-	-	-	-	2
01-10-05A-*S*	2	1	-	-	-	-	-	-	-	3
01-12-01A-*L*	4	5	9	4	-	1	2	-	-	25
01-12-01A-*S*	-	2	1	-	-	-	-	-	1	4
01-13-01B	3	1	-	-	4	-	-	-	-	8
01-15-01A	-	2	-	1	-	-	-	-	-	3
01-15-02A	1	-	3	-	1	-	-	-	1	6
01-16-02A	1	1	2	1	-	-	-	-	-	5
02-01-02B	1	-	-	-	-	-	-	-	-	1
03-01-02A	-	-	-	2	-	-	-	-	-	2
03-01-03A	-	-	-	-	1	-	-	-	-	1
03-03-01A	-	-	1	-	-	-	-	-	-	1
07-03-09A	1	-	-	-	-	-	-	-	-	1
Total	28	35	38	35	29	11	4	-	2	182
Number of Levels Excavated	14.5	14.5	14.5	13.0	11.0	9.0	6.0	2.0	-	-
CI	1.9	2.4	2.6	2.7	2.6	1.2	.6	-	-	-

[1]*L* indicates large artifacts of a particular variety
S indicates small artifacts of a particular variety

Diagnostic materials from Stratum II above the feature and in other squares represent a broader inventory of tools. Tool forms associated with the lower strata include *Frio (01-01-02D)*, *Fairland/Edgewood (01-01-02L)*, *Lange (01-01-02A)*, *Marshall (01-01-02I)*, and *Williams (01-01-02N)* points. Bifaces from procurement *(01-15-01A* and *01-15-02A)*, initial modification *(01-10-01A* and *01-10-02A)*, primary modification *(01-10-03A)*, and secondary modification *(01-10-04A* and *01-10-05A)*, and biface/point fragments and segments *(01-12-01A)* show a marked increase from the lower levels. They reflect a renewed interest in all stages of tool manufacturing. In addition, new tool forms appearing in the assemblage include drills *(01-02-03A)*, backed bifaces *(01-09-01A)*, small point fragments *(01-12-01A)*, small preforms *(01-10-05A)*, and a possible abrader *(03-03-01A)*.

The tool inventory from Stratum I is similar to that of Stratum II as reflected by small points *(01-01-06A)*, small point preforms *(01-10-04A* and *01-10-05A)*, and drills *(01-12-01B)*. Corner-notched large points are still present *(01-01-02Q)* along with contracting stemmed forms *(01-01-01A* and *01-01-01C)*. Pottery occurs in small quantities. A single decorated sherd *(02-01-02A)* was found 3 m west of Structure 2 in C50-24. Other sherds from the same vessel were found in the upper levels of the structural mound. In general, pottery was not discarded in the open areas on the south terrace. Bifaces from the reduction sequence were not as frequently encountered in Stratum I as they were in previous strata. For the first time in the south terrace area, primary *(01-10-03A)* and secondary *(01-10-04A* and *01-10-05A)* reduction stage bifaces occur more frequently than bifaces from the procurement *(01-15-02A)* and initial modification *(01-10-01A* and *01-10-02A)* stages of tool manufacturing.

Structure 1

Structure 1 is near the center of Block B. As previously indicated, excavation emphasis concentrated on defining the limits of the structure and only the waterscreen square (B34-5) was excavated to depths approaching culturally sterile deposits. The materials from Structure 1 were obtained from 43 contiguous squares. One square (B35-18) in the northern portion of the structure was left as a stratigraphic control block.

Time limitations prevented the complete exposure of the floor surface. Only seven interior squares, two squares along the structure's periphery, and the waterscreen square sampled materials on the floor surface. Near the floor level the standard excavation procedures were modified for six of the interior test squares. Instead of using an arbitrary 10 cm level interval during the excavation of the roof fall matrix, Level 4 was excavated to the floor surface. This level ranged from 12-16 cm thick because of variations in the floor surface. Pollen and flotation samples were collected from the floor surface of all six interior squares. The pollen counts were exceedingly low. The subsequent level (5) removed the remaining fill below the floor to an arbitrary depth of 50 cm. Materials from these squares are handled separately in the analysis of Structure 1 materials and are indicated by an asterisk (*) in Table 61.

Table 61. Vertical distribution of artifacts and debitage from Structure 1 at 34Pu-74.

Artifact Variety	Arbitrary Levels (10 cm) 1	2	3	4	4*	5	5*	6	7	8	9	10	Wall Scraping	Total
01-01-01A		1	1											2
01-01-01B			1											1
01-01-02B	1				1									2
01-01-02D	1		1											2
01-01-02H							1							1
01-01-02I		1												1
01-01-02K								1						1
01-01-02L		1												1
01-01-02M			1											1
01-01-02S							1							1
01-01-04A		1	1											2
01-01-06A	3	5	1											9
01-01-06F	1													1
01-01-07B	1													1
01-01-07C			1											1
01-01-07D			1											1
01-01-07E		2												2
01-01-08C		1												1
01-02-01C			1											1
01-02-03A	1		1		2									4
01-05-01A	1													1
01-07-01A		1												1
01-09-01A	2			1										3
01-10-01A	2	3	1			1	3	1		1				12
01-10-02A	18	16	18	5		6	5			1		1		70
01-10-03A	3	6	7		1	1	2							20
01-10-04A-*L*	2		2											4
01-10-04A-[illegible]	1	1	2	1										5
01-10-05A-*L*		1	3											4
01-10-05A-*S*	1													1
01-12-01A-*L*	11	10	10	2		5	2				1		1	42
01-12-01A-*S*	2	1	3											6
01-13-01B	3	2			2									7
01-14-01A			1											1
01-15-01A	3	1				1								5
01-15-02A	2	3			1	2							1	9
01-16-02A	2	2	4			1								9
02-01-01A		1	3											4
02-01-01D		1												1
02-01-02A	1	2												3
03-01-01A			1											1
03-01-02A			1											1
03-02-01A		2												2
03-06-01A			1											1
03-06-02A			1											1
04-01-01A								1						1
04-02-01A			1											1
04-03-01A	1	1												2
04-04-04A					1									1
07-03-04A	1													1
07-03-08A	1													1
Total	65	66	69	9	8	17	14	3	-	2	1	1	2	257
Number of Levels	43.0	43.0	43.0	4.5	6.0	3.0	6.0	2.0	1.0	1.0	1.0	1.0		
CI	1.5	1.5	1.6	2.0	1.3	5.7	2.3	1.5	-	2.0	1.0	1.0		

*squares excavated in 12 and 16 cm increments and analyzed separately.
L indicates large artifacts of a particular variety
S indicates small artifacts of a particular variety

An examination of the sorted waterscreen residue from selected levels of Square B34-5 reveals that differences in the amount of residue above and below the floor level are minor (Table 57). Organic materials are relatively scarce throughout the deposits. The average flake size as expressed by average flake weights ranges from .0108 g and .0242 g. These values are relatively low in comparison to the values obtained from the upper levels of the mound in the north terrace area. They suggest that the pattern of tool maintenance activities changed little before, during, and after the use of Structure 1.

A total of 236 chipped stone *(01-00)*, six ground stone *(07-00)*, five pecked stone tools *(04-00)*, eight pieces of ceramics *(02-00)*, two historic artifacts *(07-00)*, and 16,571 unmodified flakes *(01-16-00)* were recovered from the excavation of Structure 1. An examination of Table 61 indicates that the list of artifacts from the "above floor" matrix is extensive even though most diagnostic materials occur in small numbers.

All of the excavated fill below the floor surface represents Stratum III deposits. No features were recognized in the few squares excavated into this deposit. Diagnostic tool types related to the pre-structure component include *Marcos (01-01-02H)*, *Martindale (01-01-02K)*, and an unnamed type *(01-01-02S)* points, segments of large points or bifaces *(01-12-01A)*, and a mano *(03-01-01A)*. Bifaces from the reduction sequence reflect early procurement *(01-15-01A)*, initial modification *(01-10-01A* and *01-10-02A)*, and primary shaping of tools *(01-10-03A)*. No examples of the secondary refinement of bifaces *(01-10-04* and *01-10-05A)* were recovered from below the floor level. Chipped stone tool manufacturing and maintenance activities are indicated by the reduction stage bifaces and waterscreen residue. The processing of floral products is suggested by the mano.

The floor surface of Structure 1 yielded relatively few diagnostic artifacts and flake debris. Only 17 tools were recovered from Level 4 of the structure's interior and peripheral areas. Table 61 reveals that the unmodified flake density (CI) for the floor level is low (42.2) in comparison to the values obtained for levels immediately above (109.1) and below (169.3) the floor surface. These data suggest that the structure interior was maintained and kept relatively clean of debris. Diagnostic artifacts from the roof fall and floor surface include an *Ensor (01-01-02B)* point, a drill fragment *(01-02-03A)*, a backed biface *(01-09-01A)*, bifaces from the reduction sequence *(01-10-01A, 01-10-02A*, and *01-10-03A)*, modified flakes *(01-13-01B)*, and an unmodified green chert (Type C) nodule *(04-04-04A)*. No pottery was found on the floor of Structure 1.

A 28 cm thick ashy silt loam matrix overlies the burned post and daub roof fall layer. This amount of ash cannot be derived from burning a single structure and must represent matrix deposited after Structure 1 burned. Presumably, the depression left by the burned structure and surrounded by a low earth and gravel berm became a focal point for dumping ash, broken tools, and debris. Evidence of the later deposition of materials over the burned structure is provided by Feature 78-14 located within the ashy matrix.

The list of diagnostic materials within the upper ash unit is provided in Table 61 (Levels 1-3). Despite the extensive variety of tools from this

layer, tool concentration indicies are relatively low (1.5 to 1.6) in comparison to that from deposits immediately below the floor (2.3 to 5.7). A similar pattern is present in the CI for flake debitage (Table 59). The CI for the ash matrix ranges from 100.6 to 109.1, while that from below the floor ranges from 163.7 to 169.3. These differences suggest that the intensity of activities conducted within the upper ash deposits are less than those activities conducted prior to the existence of Structure 1. Perhaps the upper ash matrix is originally derived from contexts relatively free of cultural materials (i.e., cleaning hearths, etc.).

The ash overlying the roof fall contained all small points *(01-01-06, 01-01-07,* and *01-01-08)*, small point preforms *(01-10-04A* and *01-10-05A)*, small point fragments *(01-12-10A)*, pottery *(02-01-01A, 02-01-01D,* and *02-01-02A)*, and most of the pecked *(04)* and ground stone *(03)* artifacts from the Structure 1 excavation unit. Large points are less common than small points in the upper ash and most have corresponding counterparts in deposits below the floor surface. However, *Marcos (01-01-02H), Carrollton (01-01-04A)*, and unnamed types *(01-01-02Q* and *01-01-02S)* were found only above the floor surface. The upper ash also contained drills *(01-02-01C* and *01-02-03A)*, scrapers *(01-05-01A)*, a possible hoe fragment *(01-07-01A)*, and backed bifaces *(01-09-01A)*. There is a significant increase in the number of bifaces representing the secondary modification stage *(01-10-04A* and *01-10-05A)* over the lower levels. However, cobble procurement *(01-15-01A* and *01-15-02A)*, initial modification *(01-10-01A* and *01-10-02A)*, and primary modification *(01-10-03A)* stages are still abundant.

Structure 2

Structure 2 is 23 m south of Structure 1 in the northeast corner of Block C. Excavations were aimed at exposing the entire structure and none of the 42 contiguous squares were excavated to culturally sterile deposits. Excavation procedures for Level 3 were modified somewhat for 19.5 squares near the center of the structure. The interior squares were excavated as two units. Level 3A consisted of the matrix from 20 cm to the floor surface. Level 3B extended from the floor surface to an arbitrary depth of 30 cm. Pollen and flotation samples were collected from the floor surface at 1 m intervals in one north-south and two east-west transects across the structure. The pollen counts were too low to discern activity differences within the structure (Appendix B).

A total of 549 chipped stone artifacts *(01-00)*, 37 ceramic sherds *(02-00)*, one ceramic pipe *(02-02-01A)*, 15 ground stone *(03-00)*, eight pecked stone *(04-00)*, and 29,983 unmodified flakes *(01-16-00)* were recovered from the excavations of Structure 2 (Table 62).

The sample of cultural materials underlying Structure 2 came from within 15 cm of the floor. Despite the shallow depth, the matrix below the floor correlates with Stratum IV within the south terrace area. Diagnostic materials from this unit include small points *(01-01-06B* and *01-01-07A)*, small biface/point fragments and segments *(01-12-01A)*, and ceramics

Table 62. Vertical distribution of artifacts and debitage from Structure 2 at 34Pu-74.

Artifact Variety	Arbitrary Levels (10 cm) 1	2	3	3[1]	3[2]	4	Post Holes	Wall Scraping	Total
01-01-01A	3	9		1		1			14
01-01-02A		2				1			3
01-01-02D		1	1			4			6
01-01-02E	2		1			1			4
01-01-02H	1								1
01-01-02L	3	1				1			5
01-01-02M					1	1			2
01-01-02Q	2								2
01-01-02S			1						1
01-01-04A	1								1
01-01-06A		2							2
01-01-06B	1					1			2
01-01-06E	1								1
01-01-07A		1				1			2
01-02-01C				1					1
01-02-03A	2								2
01-05-01A	1		1						2
01-08-01A						1			1
01-09-01A		3	1			3			7
01-10-01A	6	4	4		1	10			25
01-10-02A	22	24	9	6	9	42	1		113
01-10-03A	12	7	3	4	7	17	1		51
01-10-04A-*L*	3	1			2	2			8
01-10-04A-*S*	2	1							3
01-10-05A-*L*		1	1		1	1			4
01-10-05A-*S*	1	1	1						3
01-11-01A			1			1			2
01-11-02A	2					1			3
01-12-01A-*L*	18	20	6	3	8	19			74
01-12-01A-*S*	2	2		1	1	1			7
01-13-01A	2	4	1	1		8			16
01-13-01B	46	30	17	11	7	33		2	146
01-13-01C	4				1	1			6
01-14-01A	1	1			1	1			4
01-15-01A	1		1			2			4
01-15-02A	3	5		1	1	2	1		13
01-16-02A		2	1	2		3			8
02-01-01A	8	2				1			11
02-01-02A	1	8				1			10
02-01-02B	1								1
02-01-02C		1							1
02-01-03A	11	2						1	14
02-02-01A		1							1
03-01-01A			1			3			4
03-01-02A		2			1	1			4
03-01-04A								1	1
03-02-01A		1							1
03-04-01A	1								1
03-06-01A			1						1
03-06-02A		1			1	1			3
04-02-01A			1	1	2				4
04-02-02A		1				1			2
04-03-01A	1								1
04-04-03A		1							1
Total	165	142	53	32	44	167	3	4	610
Number of Levels	42.0	42.0	14.5	19.5	19.5	31.0			149
CI	3.93	3.38	3.66	1.64	2.26	5.38			

L indicates large artifacts of a particular variety
S indicates small artifacts of a particular variety
[1] above floor
[2] below floor

(02-01-01A and *02-01-02A). Gary (01-01-01A), Lange (01-01-02A), Frio (01-01-02D), Trinity (01-01-02E),* and *Fairland/Edgewood (01-01-02L)* points occur below the floor. Other chipped stone tools from Stratum IV include a tanged biface *(01-08-01A)*, backed bifaces *(01-09-01A)*, and modified flakes *(01-13-01A* and *01-13-01B)*. Bifaces from the reduction sequence are plentiful and are dominated by initial reduction *(01-10-01A* and *01-10-02A)* and primary modification *(01-10-03A)* stages, as well as broken segments of points and bifaces *(01-12-01A)*. Pecked and ground stone items from below the floor include manos *(03-01-01A, 03-01-02A,* and *03-06-02A)* and pitted stones *(04-02-02A)*. This range of artifact types along with a relatively high concentration of flake debitage (CI = 231.3) suggests that numerous activities involving the processing of floral and faunal resources and the manufacturing and maintenance of chipped stone tools occurred prior to the building of Structure 2.

Materials from the floor surface of Structure 2 varied little from those found beneath the floor. Diagnostic materials include a *Gary* point *(01-01-01A)*, a drill fragment *(01-02-01C)*, and a pitted stone *(04-02-01A)*, and modified flakes *(01-13-01A* and *01-13-01C)*. Most of the bifaces reflecting the reduction sequence represent initial *(01-10-02A)* and primary *(01-10-03A)* modification stages and broken segments of points *(01-12-01A)*. No pottery and only one small point segment *(01-12-01A)* were found on the floor surface. Table 59 indicates that the concentration index of flake debitage from the central floor surface is relatively low (3A = 71.4). However, this value is misleading since it represents only a partial level. The concentration index for the combined Levels 3, 3A and 3B yields a value of 229.3 and is comparable to values obtained for Level 4 (CI = 231.3).

The matrix overlying Structure 2 floor and roof fall materials lacked the ashy loam noted from Structure 1. Cultural materials in the overlying matrix were relatively abundant. The CI of tools ranged from 3.7 to 3.9, while the flake debitage ranged from 276.2 to 177.1. The types of artifacts are also extensive and varied. They include nine varieties of large and four varieties of small points, five varieties of ceramics, a ceramic pipe, three varieties of chipped stone, six varieties of ground stone, and four varieties of pecked stone artifacts (Table 62). Bifaces from all stages in the reduction sequence are abundant. One major difference is the increase in the number of secondary modification *(01-10-04A* and *01-10-05A)* stage bifaces. A similar pattern was also noted for the upper matrix in Structure 1.

South Terrace Area Comparisons

Despite the non-contiguous distribution of squares adjacent to the structural mounds, general correlations of materials are possible. Specific varieties of points occur in low frequencies and often from several stratigraphic units. The occurrence of numerous large point varieties in deposits above and below the floor surface of Structure 2 has already been mentioned. This trend is also apparent when contrasting materials between the three excavation areas. *Marcos* points *(01-01-02H)* occur below the floor of

Structure 1 and above the floor in Structure 2, an unnamed corner-notched variety *(01-01-02Q)* was recovered from Level 6 adjacent to the mounds and from the uppermost levels in Structure 2. This suggests that specific point varieties may not be good indicators for correlating deposits.

The general distribution of small points *(01-01-06, 01-01-07,* and *01-01-08)*, backed bifaces *(01-09-01A)*, and pottery *(02-01-00)* are believed to be more revealing. These items occur in Strata I-III (Levels 1-5) in areas adjacent to the structures, in the ashy matrix above the floor level in Structure 1, and both above and below the floor level in Structure 2. The absence of these items from below Structure 1 may merely reflect the limited testing of the sub-floor deposits. Large points with similar distributions include *Gary (01-01-01A), Frio (01-01-02D), Fairland/Edgewood (01-01-02L), Trinity (01-01-02E),* and *Marshall (01-01-02I)*. Presumably these items constitute portions of an assemblage used during the occupation of the structures.

By examining artifact class rather than specific variety frequencies several general trends emerge. The combined categories of corner-notched points constitute 68% of the large points from the south terrace area and predominate all levels. Although contracting stemmed points *(01-01-01A)* constitute only 25% of the large points from the south area, 89% of these occur above the floor levels within the structural mounds and the upper two levels in adjacent areas of the south terrace. Similarly, 90% of the combined small points *(01-01-06, 01-01-07,* and *01-01-08)*, small point preforms *(01-10-04A* and *01-10-05A)*, and small point segments *(01-12-01A)*, and 96% of the ceramics have the same distribution. These differences underscore the nature of an additive artifactual assemblage and suggest that the deposits below the floor as well as Stratum III materials in adjacent areas represent earlier occupations by people participating in the same cultural tradition.

Other large point types are restricted to Stratum IV which lacks ceramics, small points, and large point varieties associated with the structures. These varieties include *Shumla (01-01-04C), Williams (01-01-02N), Martindale (01-01-02K),* and unnamed types *(01-01-02S* and *01-01-03A)*. The sample of materials from the strata are small. Unfortunately, other tools of the assemblage cannot be segregated. Many bifaces from the reduction stage are indistinguishable from those found in later components.

Some vertical differences are also apparent in the distribution of small point varieties within the matrix overlying the roof fall deposits of both structural mounds. Although not plentiful, small side-notched points *(01-01-07A)* are restricted to the uppermost deposits while small corner-notched points *(01-01-06A)* occur throughout the overlying matrix. These differences tenuously reflect an ephemeral late prehistoric occupation on top of the structural mounds.

Horizontal differences within the south terrace area are also apparent (Table 54). Most of the small points *(01-06-00, 01-07-00,* and *01-08-00)*, drills *(01-02-00)*, scrapers *(01-05-01A)*, backed bifaces *(01-09-01A)*, and cores *(01-14-01A)* within the chipped stone category are restricted to the

two structural mounds. In addition, the structural mounds contained 98% of the ceramics *(02-01-00)*, 84% of the ground stone *(03-00)*, and all of the pecked stone artifacts *(01-00)* from the south terrace area.

Other differences are noted in the density of both artifacts and flake debitage. Structural Mound 1 contained almost two-thirds less artifacts (CI = 1.7) and half as many flakes (CI = 107.3) as either Structural Mound 2 (CI = 4.1 and 201.2) or areas adjacent to the structures (CI = 4.1 and 261.2). These differences reflect the scarcity of cultural debris contained in the thick/ashy loam matrix dumped into the depression after Structure 1 burned.

The density of materials throughout the structural mounds is not uniform. Figure 50 reveals that the greatest density occurs along the periphery of the structures. This is particularly evident in Level 3 for Structure 1 and Level 2 in Structure 2. The density pattern around the structures may either reflect materials contained within the earthen berm surrounding the structures or the intensity of outside activities conducted close to the structures.

NORTH AND SOUTH AREA CORRELATIONS

The correlation of assemblages and component identification is not easy when dealing with an additive sequence. The differences between the structures in the south terrace area and the superimposed features in the north terrace area suggest that different activities were conducted at each end of the terrace. Thus, slight assemblage differences may reflect either small sampling biases, temporal differences, functional differences, or combinations of all three factors. Furthermore, specific occupations need not be present at both ends of the terrace. The following components are defined on the presence/absence and frequencies of selected artifact categories within a series of assemblages at 34Pu-74. At least four prehistoric assemblages are tenuously recognized. Excavations during the 1979 field season will undoubtedly clarify the occupational sequence at the site.

Perhaps the easiest method of tentatively identifying components and correlating features between the north and south terrace areas is in reference to a major assemblage which occurs in both areas. Other components can then be defined by their content and stratigraphic relationship to the "reference assemblage". In this instance, the reference assemblage is defined by the materials overlying the two structure floors.

The diagnostic materials occurring above the structure floors include, but are not limited to, *Gary (01-01-01A)*, *Frio (01-01-02D)*, *Trinity (01-01-02E)*, *Fairland/Edgewood (01-01-02L)*, and *Carrollton (01-01-04A)* large points, *Scallorn (01-01-06A)* small points, small point preforms *(01-10-04A* and *01-10-05A)*, drills *(01-02-03A)*, backed bifaces *(01-09-01A)*, slipped and unslipped, grog tempered wares *(02-01-01A* and *02-01-02A)*, shell tempered plain wares *(02-01-03A)*, ceramic pipes *(02-02-01A)*, manos *(03-01-02A)*, grinding slabs

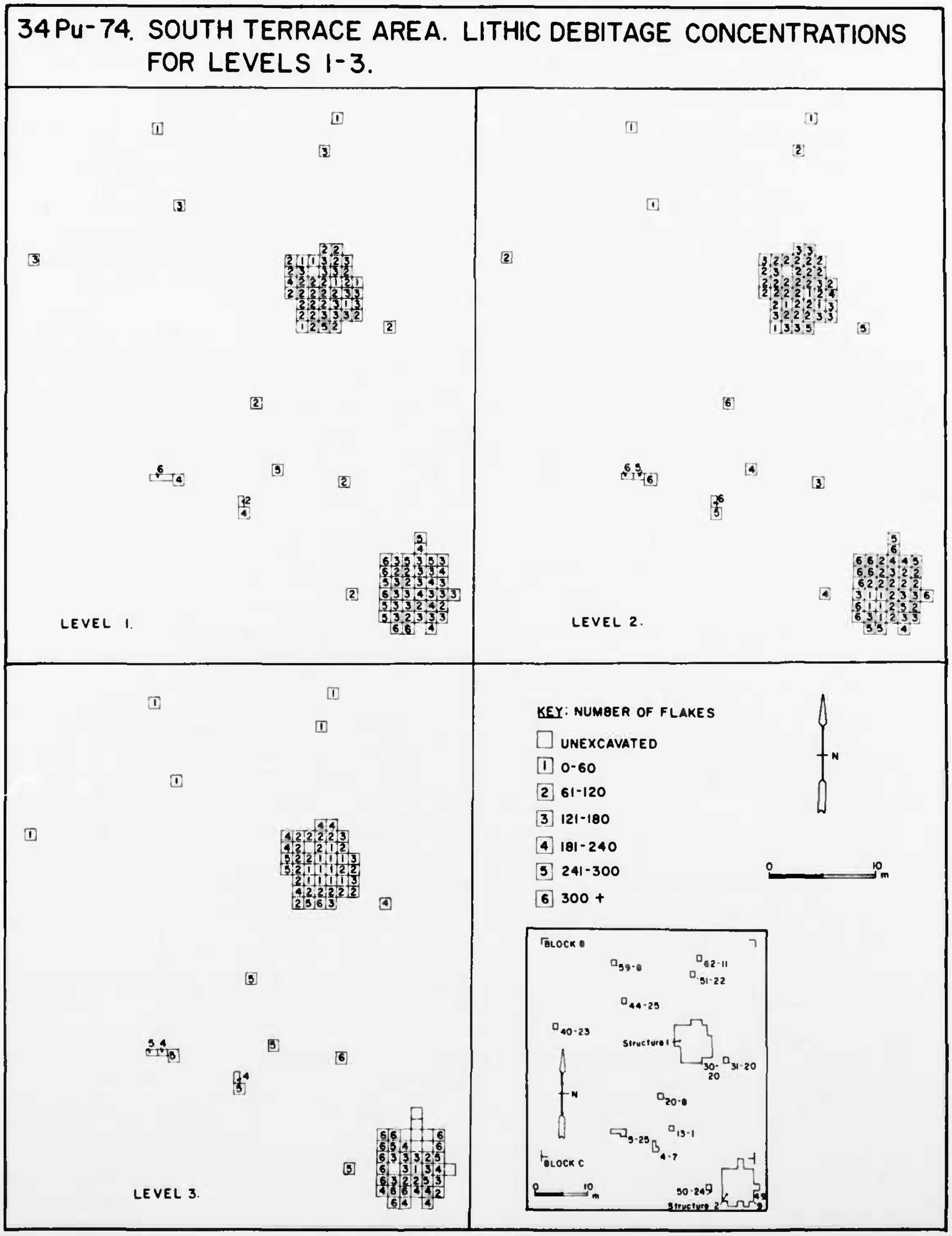


Fig. 50. Lithic debitage concentrations for levels 1-3 showing densities along structure peripheries in South Terrace Area of the Blessingame site (34Pu-74).

(03-02-01A), and pitted stones *(04-02-02A)*. Other traits such as modified flakes and bifaces from tool manufacturing stages are present in most components but are not considered to be diagnostic. Many diagnostic implements from the assemblage also have counterparts below the floor surface. However, their frequency relative to the floor surfaces is different. The "above floor" assemblage contains 89% of the large contracting stemmed points *(01-01-01A)*, 90% of the combined small points *(01-10-06, 01-01-07*, and *01-01-08)*, small point preforms *(01-10-04As and 01-10-05As)*, small point segments *(01-01-01As)*, 100% of the drills *(01-02-01C* and *01-02-03A)*, and 96% of the ceramics from the two structural mound areas. Similar materials are found in Strata I and II in the south terrace areas adjacent to the mound.

The assemblage is associated with at least two structures. Evidence suggests that a small village or hamlet was built in the south terrace area and occupied between the late 10th and mid 13th centuries A.D. by early Caddoan people. With the possible exception of the *Graves Chapel* variety of *Red River* pipe, no exotic items such as stone beads, ear spools, conch shells, or copper items were recovered from 34Pu-74. Only 6% of the ceramics have incised body or decorated rim forms. Although 90% of the pottery from the site comes from the two structural mounds, the total number of sherds (N=50) is small in comparison to similar sites on the Red and Arkansas rivers (Bell 1972; Eighmy 1969; Harden and Robinson 1974; Rohrbaugh 1973; Wyckoff 1976b; Wyckoff and Barr 1967). It is postulated that the structures at 34Pu-74 served as habitation dwellings rather than for specialized or communal functions.

An early Caddoan assemblage is also present in the north terrace area as indicated by similar frequencies of selected items from Stratum I and the upper portion of Stratum II (Levels 1-3). All of the ceramics *(02-01-03A)*, 80% of the small points *(01-01-06A* and *01-01-07A)*, small point preforms *(01-10-04As)*, and 83% of the large contracting stemmed points *(01-01-01)* are confined to these strata. At this time the assemblage is poorly represented in undisturbed areas adjacent to the mound. By extension, one pit (F78-8) is believed to be early Caddoan and may be contemporaneous with the structures. It is postulated that the north terrace mound represents a specialized activity area. Although activities associated with the pit are uncertain, the associated flake debitage reflects primarily stone tool maintenance (resharpening). The mound probably served as a processing area.

On the basis of artifact frequencies rather than mere presence/absence, two assemblages of an earlier component can be tentatively identified at both ends of the terrace. The artifact sample of early component assemblages is small. Consequently, the following sub-components are provisional. Additional materials from lower components will clarify the nature of these assemblages.

The upper assemblage of this earlier component shares many kinds of large point forms and other tools with the early Caddoan assemblage, but in different frequencies. Large corner-notched points are the most dominant form. Large points are represented by *Frio (01-01-02D)*, *Trinity (01-01-02E)*, *Lange (01-01-02A)*, *Marcos (01-01-02H)*, *Darl (01-01-02M)*, *Williams (01-01-02N)*, and *Carrollton (01-01-04D)* types. Manos *(03-01-00)*, modified flakes *(01-13-00)*,

and numerous large bifaces *(01-10-00)* from all stages of the reduction sequence are also present. Items rarely found in this assemblage that were abundant in the early Caddoan component include *Gary (01-01-01A)*, *Fairland/ Edgewood (01-01-02L)*, all varieties of small points and small point preforms, drills *(01-02-00)*, and ceramics *(02-01-03A)*.

This assemblage is represented in "below floor" deposits in the structural mounds and within Stratum III (Levels 4 and 5) in the south terrace area. In addition, this assemblage is present in the lower portion of Stratum II (Level 4) in the north mound and adjacent areas. Associated features include horizontal rock concentrations (F78-2 and 78-10) in the north terrace area and possibly two rock features (78-11 and 78-22) in the south terrace area adjacent to the structures.

Dates and cultural affiliations for this assemblage are uncertain. A single MASCA corrected radiocarbon date of A.D. 1660 ±85 (UGa-2534) associated with Feature 78-10 is clearly too recent. The presence of three large contracting stemmed points *(01-01-01A)*, two potsherds *(02-01-01A* and *02-01-02A)*, and three small points *(01-01-06A)* may indicate either Woodland phase component or intrusive early Caddoan items into a Late Archaic assemblage. Since these late diagnostic items do not occur equally across all five areas but are generally clustered below the floor of Structure 2 where post holes are known to have mixed the deposits, the latter interpretation is favored at this time.

The range of Late Archaic activity sets are also poorly understood. The presence of grinding implements in several areas suggests that plant resources were being processed. This is further supported by an increase in nutshell fragments from the waterscreen matrix associated with Feature 78-10. Specific functions associated with the rock features are uncertain. All may have been associated with burning activities. Undoubtedly stone tool manufacturing and maintenance was conducted at both ends of the terrace as indicated by the abundance of bifaces representing all stages of the reduction sequence. A long or short term base camp situation is posited for the Late Archaic occupation of the terrace.

The lower assemblage of the earlier component is tentatively identified at both ends of the terrace, although it is believed to be better represented in the south terrace area. This assemblage is characterized by a number of large corner-notched, side-notched, and straight stemmed point forms not commonly found in the upper assemblages. These points include *Bulverde (01-01-04D)*, *Martindale (01-01-02K)*, *Williams (01-01-02N)*, and unnamed types *(01-01-02S* and *01-01-03A)*. Many of the larger corner-notched point forms present in the upper levels are absent in this assemblage as are ceramics and small point forms. Other items in this assemblage include pitted stones *(04-01-01A)* and various bifaces *(01-10-00)* from the manufacturing sequence.

The lowest assemblage is associated with Stratum IV in the south terrace area adjacent to the structural mounds and the lower portions of Stratum III in the north terrace mound. The relationship of one rock concentration (F78-3) in the north mound is uncertain. It may be related to either this lower assemblage or to the overlying Late Archaic assemblage.

No dates are available. However, the points typologically resemble Archaic forms. At this time there are insufficient materials from the assemblage to postulate the range of activity sets or determine whether the site represents a specialized extractive or processing locality, or a short term or intermittent long term base camp.

A late aboriginal occupation above the reference assemblage is tentatively indicated by a limited amount of material from both ends of the terrace. Evidence for this component is scant, and if valid, reflects only an ephemeral occupation on the terrace. Diagnostic items are limited, but the assemblage is not necessarily restricted to small side-notched points *(01-01-07A, 01-01-07B,* and *01-01-07C)* only found in the uppermost levels of the three mounds. Rock feature 78-14 in the ashy matrix overlying Structure 1 may be affiliated with either this latest occupation or the early Caddoan component. In the north terrace mound two rock hearths (F78-6 and 78-9) stratigraphically reflect this late component since they were dug into the top of the early Caddoan (Stratum I) deposits.

The artifacts and features possibly indicate a special purpose extractive camp or limited processing activities. A short term occupation is postulated.

Cultural affiliations and dates of this late component are uncertain. MASCA corrected radiocarbon dates of A.D. 1405 ±50 (Tx-3282) and 1640 ±110 (UGa-1518) were obtained from Feature 78-9. The latter date was from a small (6.1 g) charcoal sample and may not accurately reflect the age of the component. It is hypothesized that the occupation reflects a late Caddoan or protohistoric use of the terrace.

A limited amount of historic artifacts recovered during the excavations reflect Statehood period materials. All items are consistent with the historically recorded cattle raising and brush clearing activities at the site.

SUMMARY

The Blessingame site is on a prominent terrace at the confluence of Jackfork and Buffalo creeks. The site is in pasture, although brush clearing activities conducted during the 1940s have disturbed some areas of the site. Excavations during 1978 concentrated on the north and south portions of the terrace. Only 29 of the 129 squares and 8 half squares were excavated to culturally sterile deposits. The remaining test squares were used to define feature relationships. This chapter is primarily descriptive but also includes interpretations concerning activity sets and site function during each of the major components.

The complex stratigraphy, density and nature of the cultural features, and the distance between the two tested areas complicates the correlation of assemblages and delineation of components. Five areas of the site were analyzed separately in order to refine the assemblage content. At the north

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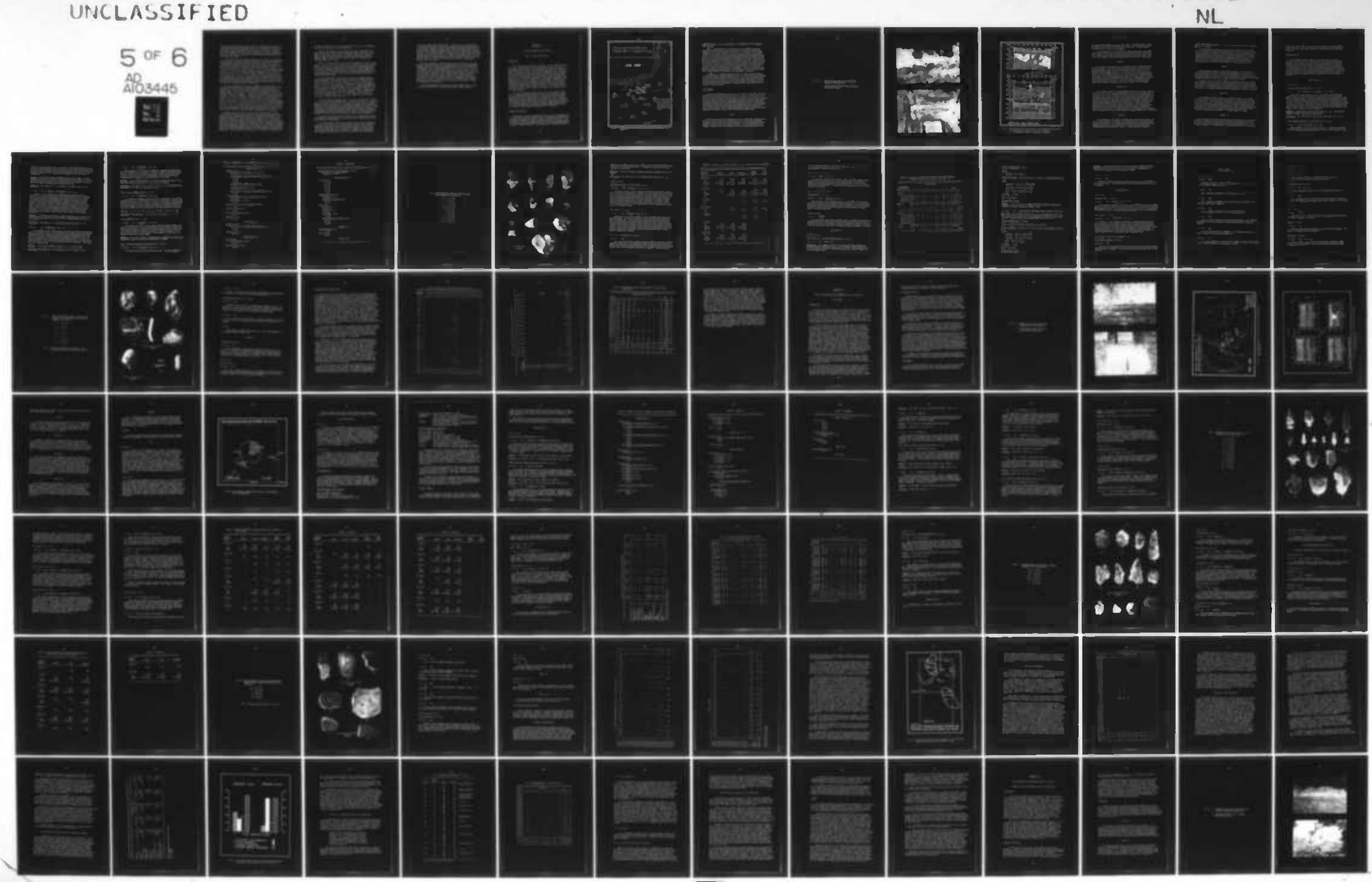

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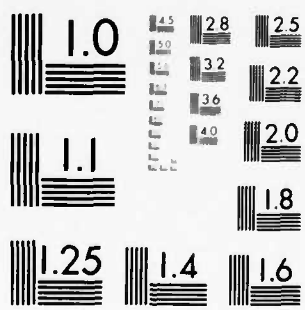


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

terrace end, a low mound containing a series of superimposed features was examined separately from the adjacent areas. At the south terrace end, two low mounds were examined separately from the off mound areas. Results of the analysis reveal that the cultural assemblage is additive. Nevertheless, five assemblages relating to four components are tenuously identified. Additional excavations in 1979 will clarify the nature and relationship of the occupational sequence.

Two stratigraphically separate assemblages of an Archaic component have been postulated. Presently, diagnostic materials from the lower assemblage of the Archaic component are not well represented. Materials from this assemblage were recovered from Stratum IV in the south terrace areas adjacent to the structural mounds and from the lower portions of Stratum III in the north terrace mound. Diagnostic materials are limited to *Bulverde (01-01-04D)*, *Martindale (01-01-02K)*, *Williams (01-01-02N)*, large expanding stemmed variety *(01-01-02S)* and large side-notched variety *(01-01-03A)* points, and pitted stones *(04-01-01A)*. Absent from this assemblage are small points *(01-01-06, 01-01-07,* and *01-01-08)*, ceramics *(02-01-00)*, and large contracting stemmed points *(01-01-01)*. A horizontal rock concentration (F78-3) may be associated with this lower assemblage. There are insufficient materials from the lower assemblage to postulate the range of activity sets or determine whether the site represents a specialized extractive/processing locality or a short or intermittent long term base camp.

The upper assemblage of the Archaic component is better defined. From the south terrace areas upper assemblage materials are obtained from the "below floor" deposits in the structural mounds and within Stratum III in adjacent areas. In the north terrace areas, this assemblage is present in the lower portion of Stratum II. Large corner-notched points dominate the diagnostic assemblage inventory. *Bulverde (01-01-04D)* and large side-notched varieties *(01-01-03A)* are absent. Possible additions to the assemblage include *Frio (01-01-02D)*, *Trinity (01-01-02E)*, *Lange (01-01-02A)*, *Marcos (01-01-02H)*, *Darl (01-01-02M)*, and *Carrollton (01-01-04A)* large point types as well as backed bifaces *(01-09-01A)*, and manos *(03-01-00)*. Occasional examples of *Gary (01-01-01A)*, *Fairland/Edgewood (01-01-02L)*, small points and preforms *(01-01-06, 01-01-07, 01-10-04A,* and *01-12-01A)*, drills *(01-02-00)*, and ceramics *(02-01-03A)* were recovered, but most are believed to be intrusive from the overlying component. Four horizontal rock concentrations (F78-2, 78-10, 78-11, and 78-22) may be associated with the upper Archaic assemblage.

Although specific artifact varieties differ between the two Archaic assemblages some similarities are present. Large corner-notched point forms dominate both assemblages and both are associated with horizontal rock concentration features. The concentration of features in the north terrace mound area probably represents a specialized activity locus. The activity localities in the south terrace area are more diffuse. The specific activity sets remain uncertain. Emphasis was placed on lithic procurement and chipped stone tool manufacturing sequences. The presence of floral remains (nutshell) and grinding implements suggests that plant processing was occurring at the site. The extent of hunting activities is not well defined for either Archaic assemblage. Site functions and the duration of occupation is uncertain for

the lower assemblage but it may be hypothesized that the upper assemblage reflects a short term or long term base camp.

Similar rock features in association with Archaic assemblages have been reported from 34Pu-72 and 34Pu-99 (Bobalik 1977: 556; 1978). Other sites in the Clayton Project Area with Archaic components are 34Lt-21, 34Lt-23, 34Lt-25, 34Lt-26, 34Lt-27, 34Lt-30, 34Lt-34, 34Lt-56, 34Ps-57, 34Pu-73, 34Pu-75, 34Pu-77, 34Pu-79, 34Pu-83, 34Pu-100, 34Pu-102, and 34Pu-105 (Bobalik 1977: 564).

There is no clear evidence for a Woodland component at 34Pu-74. Occasional *Gary* points *(01-01-01A)*, small *Scallorn* points *(01-01-06A)*, and potsherds *(02-01-00)* have been recovered in the upper assemblage assigned to the Archaic component. However, these items occur in small numbers and are not found throughout the tested areas. Their horizontal distribution is restricted to a few areas which are characterized by bioturbation. The present data suggest that the terrace area was not extensively utilized during the Woodland stage.

A single assemblage is recognized for the early Caddoan component. Diagnostic materials mirror many items from the upper assemblage of the Archaic component. These items include *Frio (01-01-02D)*, *Trinity (01-01-02E)*, *Fairland/Edgewood (01-01-02L)*, and *Carrollton (01-01-04A)* points; bifaces *(01-10-00)* from all stages of the reduction sequence; ground stone manos *(03-01-02A)*; and pitted stones *(04-02-02A)*. Items rarely found in this assemblage but plentiful in the previous assemblage include *Darl (01-01-02M)*, *Marcos (01-01-02H)*, and *Lange (01-01-02A)* points. Hallmarks of the component are new additions to the assemblage. These include large contracting stemmed points *(01-01-01)*, small points *(01-01-06)*, drills *(01-02-03A)*, backed bifaces *(01-09-01A)*, and several kinds of ceramics *(02-01-01A*, *02-01-02A*, and *02-01-03A)*.

The early Caddoan assemblage occurs in Strata I and the upper portion of II in the north terrace mound area. In the south terrace it is associated with at least two subrectangular structures and Strata I and II in areas adjacent to the structures. These structures are believed to be habitation dwellings rather than communal or specialized buildings, and a small village or hamlet is postulated for the south terrace area. Results from seven radiocarbon and three archaeomagnetic samples from the two structures have produced dates spanning 520 and 810 years. However, a partial clustering between A.D. 940 and 1250 is consistent with the artifact assemblage.

The north terrace mound area is believed to be a specialized activity area where tool maintenance was conducted along with processing activities associated with a pit (F78-8).

The relationship of early Caddoan groups residing at the Blessingame site with similar groups living in the Red and Arkansas river valleys is uncertain. Decorated pottery from the site is scarce and has not been linked to defined types. With the possible exception of a *Graves Chapel* pipe, exotic goods are absent from 34Pu-74. Although this pipe form is more common on the Red River, examples are also known from the Arkansas

River Basin (Brown 1976; Hoffman 1967). Either the early Caddoan hamlets in the Ouachita Mountains represent non-specialized sites occupied by groups from the Red or Arkansas basins or they represent indigenous groups which were marginally involved in developments occurring in these major drainages. There is little comparable material from other areas of the interior Ouachita Mountains to refine this problem. Although no other hamlet sites are currently known from the region, other sites in the Clayton Project area with early Caddoan materials are 34Lt-22, 34Lt-26, 34Lt-27, 34Lt-30, 34Lt-31, 34Lt-32, 34Ps-57, 34Pu-72, 34Pu-78, 34Pu-99, 34Pu-100, 34Pu-102, and 34Pu-105 (Bobalik 1977: 571; 1978).

The third component is provisionally based on features and a limited amount of materials occurring in the uppermost levels of the three mounds. Although many items cannot be segregated from the previous early Caddoan assemblage, the small side-notched points *(01-01-07A, 01-01-07B,* and *01-01-07C)* tend to occur in upper deposits above the structure floors. In the north mound area rock hearths (F78-6 and 78-9) are believed to reflect this late aboriginal occupation. Two radiocarbon dates (MASCA corrected) of A.D. 1405 ±50 (Tx-3282) and 1640 ±110 (UGa-1518) are available from Feature 78-9. These dates suggest either a late Caddoan or protohistoric use of the terrace. The nature of activities reflected in this limited assemblage is uncertain, but hunting and cooking are suspected. A short term occupation is postulated.

The fourth component is historic and reflects recent cattle raising and brush clearing activities recorded during the Statehood period.

CHAPTER 12

THE JOCK STANDEFER SITE (34Pu-79)

Jerry R. Galm and Rain Vehik

INTRODUCTION

This site, on the south and east banks of a relic channel of Jackfork Creek is about 200 m south of the present course of the creek and extends along a narrow, long east-west ridge and north forming an L-shaped configuration (Fig. 51). An intermittent creek is at the west end of the ridge and historic structures (a collapsed house, log cabin, and farm yard) mark the east end of the ridge which is grass covered (Fig. 52a). The farm yard lacks vegetation, is slightly eroded, and may have been leveled with a bulldozer. The northern extension of the site also served as part of the farm yard and there is evidence of the foundation of a historic structure, a cattle trough, and an historic cemetery which marks the northern terminus of the site in this area. In addition, there appears to be an old wagon trail leading northwest to the creek bottom in this portion of the site. This area is predominantly covered by grass, however scrub oaks occur adjacent to the old stream meander.

The site was located by Neal (1972: 13-14), and surface collections included chipped stone points, bifaces, cores, modified flakes, and a double-bitted chipped stone ax. Due to its location within the proposed lake, the site was tested in 1976 (Bobalik 1977: 282-306). These tests included excavating 16 post holes and a single 1 m square was excavated at the northern end of the site. Based on this work, the site was considered to be a special purpose camp which may have served as a hunting, processing, and lithic reduction station during either the Archaic or Woodland periods (Bobalik 1977: 304-306).

EXCAVATION STRATEGIES

Additional testing was recommended at the site as it appeared to be a single component special purpose camp. The 1978 testing consisted of excavating 12 randomly selected 1 m squares in Block A (Fig. 51). The placement of this block on the east-central portion of the ridge west of a collapsed house was determined by the recovery of the greatest concentration of cultural materials. In addition, the 1976 testing program

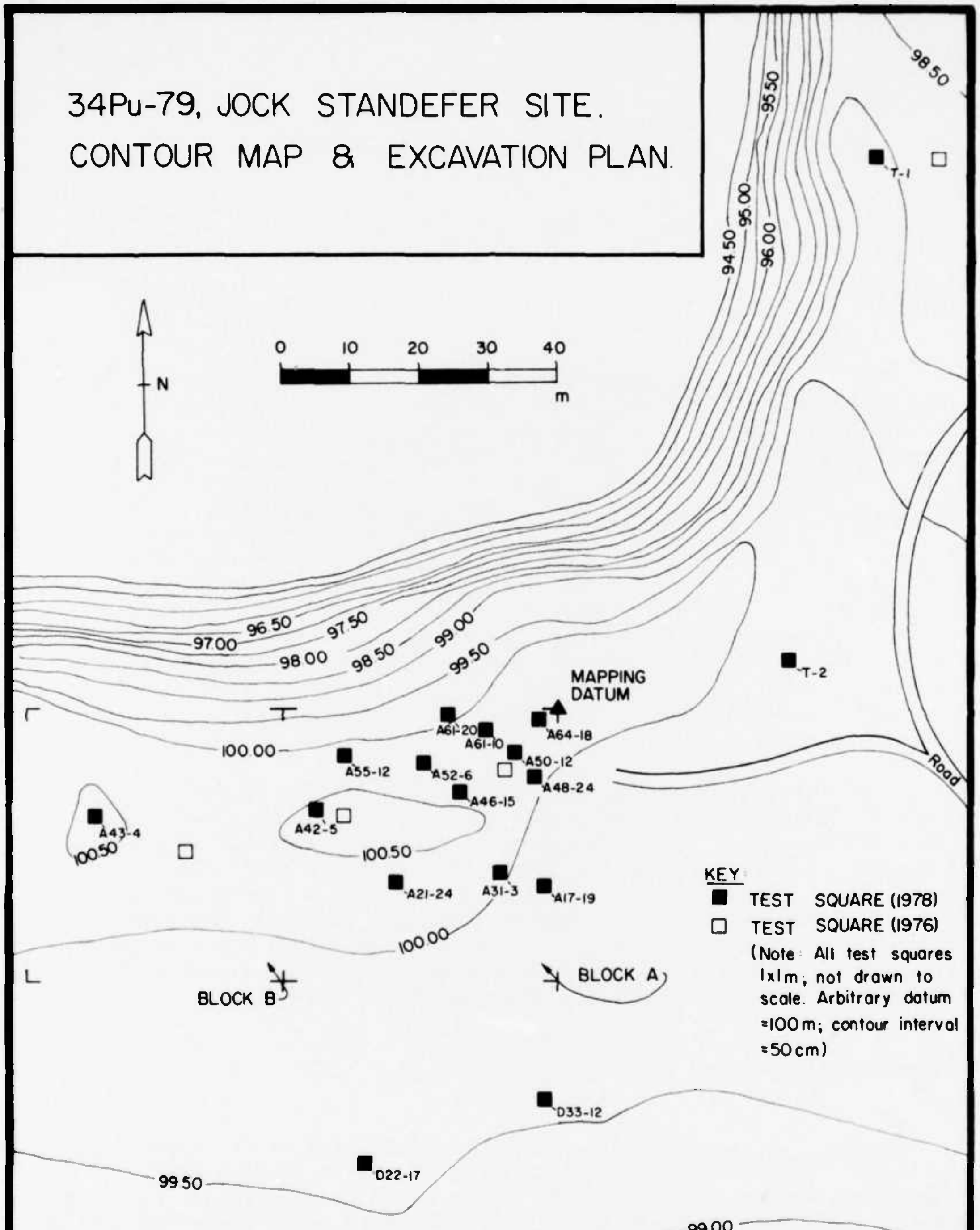


Fig. 51. Contour map and excavation plan of the Jock Standefer site (34Pu-79).

suggested that this area did not appear to be greatly disturbed (Bobalik 1977: 282-306).

However, upon beginning the excavation of the randomly selected squares it became apparent that this portion of the site had been badly disturbed as a result of historic activity. For instance, in unit A46-15 a hewn log with round nails was found approximately 40 cm below ground surface. In addition, the stratigraphy of several other squares indicated that this area had been disturbed. Stratigraphic profiles suggested that the ridge deposits have been added to during historic times. In order to test this, additional 1 m squares were excavated (Fig. 51). These included one square in Block B at the western end of the ridge, two squares south of the ridge in Block D, and one test square (labeled as TS-1) in the farm yard east of the collapsed house and one square (TS-2) in the northern portion of the site near the historic cemetery. These units were not randomly selected, and unfortunately, the excavation of these squares did not aid in understanding the nature of the disturbance in Block A.

In summary, 71 complete levels and two half levels were excavated in 17 one-meter squares during September, 1978. The half levels were excavated in order to ascertain whether additional cultural remains occurred below 30 cm in units A17-19 and 55-12. No control squares designated for water-screening were excavated due to the disturbed nature of the site, and no cultural features were identified. Each square was back filled at the end of the excavation program.

STRATIGRAPHY

Despite the disturbance in Block A, five natural strata were identified in most of the excavated squares (Fig. 53 a). The only exception was unit A46-15 in which seven strata were defined (Fig. 52 b; 53 b). For the most part, the upper strata consisted of variations of sandy loam and the lower strata contained clayey sediments and decomposed sandstone. Several substrata, primarily defined on the basis of color changes, were noted in some squares and probably reflect the disturbed nature of the deposits. Color designations were derived from dry samples and determined using Munsell Soil Color charts (Munsell 1975). Depth measurements denote the depth of strata boundaries below ground surface (Soil Survey Staff 1962: 186).

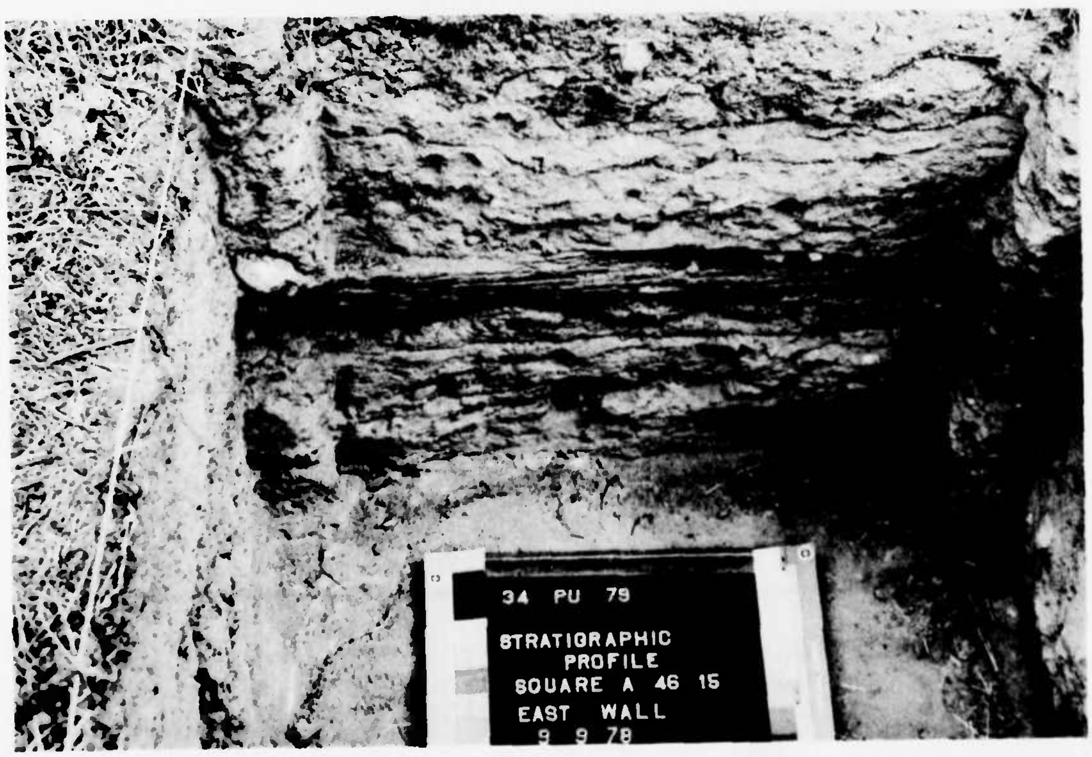
Stratum I

This stratum, varying between 2 and 12 cm in thickness, represents the A_p horizon at the site. It is composed of loose, fine sandy loam with numerous roots. A few small rocks are present in A42-5 and numerous rocks occur at the bottom of this stratum in B43-4. It is believed that this stratum is absent in TS-1 (located in the farm yard) because the top soil

Fig. 52. a: General view of east end of the Jock Standefer site (34Pu-79).

b: Stratigraphic profile of A46-15 showing hewn log in profile.

a



b

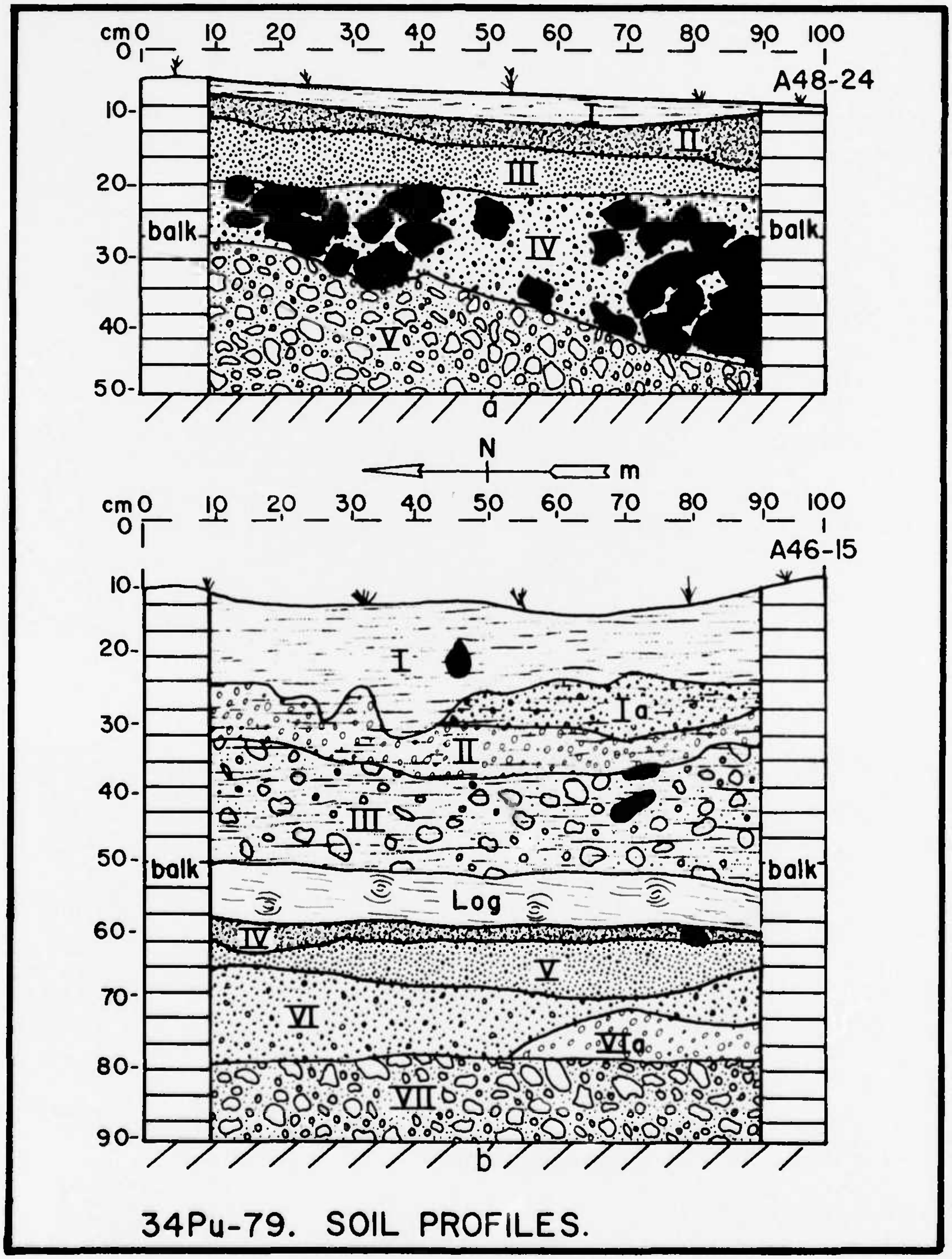


Fig. 53. Stratigraphic profiles from the Jock Standefer site (34Pu-79).
a: Stratigraphic profile of east wall of A48-24.
b: Stratigraphic profile of east wall of A46-15.

has either been removed by clearing this area or has been eroded. Colors are brown (7.5YR 5/2) to yellowish brown (10YR 5/4). Cultural remains, including historic debris, are abundant.

A unit defined in the lower portion of A46-15 consisted of yellowish brown (10YR 5/4) mottling in a dark grayish brown (10YR 4/2) sandy loam. This tended to be a compact sediment containing small gravel, and is believed to represent a transition between Strata I and II in this square.

Stratum II

This stratum is composed of a more compact sandy loam than the preceeding stratum. Also, more rocks and less roots occur. Mottling and scattered hematite flecks are also present in several squares. This stratum varies between 2 cm and 21 cm in depth in all units except TS-1 where it ranges between 25-40 cm. This unit varies in thickness between 4 cm and 18 cm, but in B43-4 the stratum is characterized by numerous rocks and ranges in thickness between 22 cm and 56 cm. Colors vary from reddish yellow (7.5YR 6/6) to pale brown (10YR 6/3), but the predominant color is yellowish brown (10YR 5/6). Cultural materials including historic debris were abundant throughout most of the squares in this stratum.

Stratum III

This stratum, varying in depth between 8 cm and 50 cm and in thickness from 4-30 cm, differs in composition between squares. Six squares (A17-19, 50-12, 52-6, 55-12, 61-20, and B43-4) are characterized by decomposing sandstone with various amounts of fine compact sandy loam which ranges in color from reddish yellow (7.5YR 6/6) to brownish yellow (10YR 6/6). The remaining squares are composed of compact, fine sandy loam sediments containing lesser amounts of sandstone. Mottling is evident in one square and scattered hematite nodules occur in two units. Colors vary from yellow (10YR 7/8) to brownish yellow (10YR 6/6). Cultural materials become more scarce even though a hewn log with round nails and historic debris occurs in A46-15. A roughly equivalent stratigraphic unit 6-12 cm thick was defined in A21-24 on the basis of a reddish yellow color (7.5YR 6/6).

Stratum IV

This stratum was confined to 12 squares and in many cases only to one wall in these squares. Its depth varies between 16-28 cm and thickness between 9 cm and 30 cm. This stratum generally consists of clayey and sandy loam sediments which have yellowish red (5YR 5/6) to yellowish brown (10YR 5/6) and yellow (10YR 7/6) colors. These sediments formed the

matrix around varying amounts of shale and decomposing sandstone. Cultural material is sparse.

One substratum was noted at a depth of 26 cm in A21-24. This consists of a reddish yellow (7.5YR 6/6) clay loam. Also in A46-15, Stratum IV is confined to a narrow (2 cm thick) lense of loose fill and grass immediately below a hewn log noted at the base of Stratum III. It would appear that this lens, which has a grayish brown color (10YR 5/2), represents the original ground surface upon which the log was placed. If this is the case, it means that at least 40 cm of sediments have been deposited over the original ground surface in this area of the site.

Stratum V

This stratum is defined in units A21-24, 48-24, 55-12, and TS-2. It is characterized by a blocky, clay loam interspersed in some instances with gravel and sandy loam. Its depth ranges between 16 cm and 38 cm and thickness between 2 cm and 16 cm. Colors are reddish yellow (7.5YR 6/6) and brownish yellow (10YR 6/6), and cultural materials are scarce.

Stratum V was also defined in A46-15, but differs in its description. These sediments consist of a loose sandy loam with some rootlets, gravels, and orange and yellow mottling. The predominant color is yellowish brown (10YR 5/4). The stratum varies in thickness between 3 cm and 10 cm, and the description is not much different than that provided for Stratum II earlier.

Stratum VI

This stratum is found in A46-15 at a depth of 55 cm. It is about 14 cm thick and consists of sandy loam that is more compact than Stratum V in this square. Small pieces of sandstone occur and contribute to some mottling in this unit. The predominant color is grayish brown (10YR 5/2). A second unit sloping toward the west was also noted. It varies between 3 cm and 10 cm in thickness and is composed of grayish brown (10YR 5/2) compact sandy loam, but it is interspersed with much more sandstone. This stratum may correspond to Stratum III in other areas of the site.

Stratum VII

This represents the basal stratum and was only noted in the east wall of A46-15. It occurs at a depth of 70 cm and has a thickness of 17 cm. This unit contains much more sandstone than the preceeding strata. It is a sandy loam and has a mottled color. The predominant color is very pale

brown (10YR 7/4). This may correspond to Stratum IV in other squares at the site, and some cultural material including historic debris was recovered.

CULTURAL REMAINS

All recovered cultural debris is described in this section. A minimum of 10,200 artifacts including lithic implements and debitage, ceramics, ground stone, and historic debris was analyzed. Artifact categories and varieties present in the Standefer site collection are listed in Table 63. Metric data for selected chipped stone artifacts are provided in Table 64. Lithic nomenclature employed in this section is derived primarily from Binford (1963) and Crabtree (1972). Reference has been made to existing typological categories whenever possible, although subjective determinations of implement use have been kept to a minimum.

Chipped Stone *(01)*

POINTS (01-00)

Large Contracting Stemmed Points *(01-01-01)*

01-01-01A N=4: 2 Complete, 2 Fragmentary (Fig. 54a-b).

These points have rounded to acute tips, blades that range from broadly ovate to narrow triangular, and straight to excurvate blade edges. Maximum width occurs at the shoulders which are pronounced. Stems are contracting with base configurations ranging from straight to broadly pointed. Cortex remnants are present on the bases of two specimens. Cross sections are biconvex. Edges are sharp and regular. One specimen exhibits a tip break that has a morphology similar to what has been referred to as impact fracture (Ahler 1971: 106). Locally available cherts dominate the lithic material types represented (Table 65).

Comments: These points are referrable to the *Gary* type. Two specimens exhibit moderate reworking along blade edges.

References: Bell 1958: 28, Pl. 14; Suhm and Jelks 1962: 197, Pl. 99.

Large Expanding Stemmed/Corner-Notched Points *(01-01-02)*

01-01-02C N=1: 1 Fragmentary (Fig. 54g)

This specimen is broken at the mid-section. It appears to have had straight blade edges and maximum width occurring at the shoulders. One

shoulder is defined but the other is broken. Broad corner notches have produced a slightly expanding stem. Lateral haft areas vary from dull to sharp. The base on this specimen is slightly concave and is also dull. The cross section is biconvex. This point was too fragmentary to be included for measurement.

Comments: This point resembles specimens of the *Edgewood* type. A flake removed from the broken surface at the mid-section has produced a burin-like appearance along one margin. It is possible that this specimen was broken during manufacture and subsequently reworked and used.

References: Bell 1958: 20, Pl. 10; Suhm and Jelks 1962: 183, Pl. 92.

01-01-02F N=4: 1 Complete, 3 Fragmentary (Fig. 54 e-f).

Points in this category reveal considerable internal diversity, apparently as a result of stages of completion and utilization. A single tip is acute and blade edges range from slightly excurvate to irregular and exhibit extensive retouch/reworking. Maximum width occurs at the shoulders which range from pronounced and barbed to rounded and poorly defined. Broad corner notches produce expanding stems. Lateral stem edges vary from dull to sharp. Bases are slightly concave to convex and dull. Small, regular flake scars are present on the bases of all specimens and result in a beveled appearance when present along one face (2 specimens). Tang areas are rounded to squared, but are intentionally defined on each specimen. Cross sections are biconvex (3) and plano-convex (1).

Comments: In general outline these specimens resemble points of the *Ellis* type, although two examples are also similar to descriptions of the *Edgewood* type.

References: Bell 1960: 32, Pl. 16; Suhm and Jelks 1962: 187, Pl. 94.

01-01-02J N=1: 1 Fragmentary (Fig. 54 c).

This specimen has one straight edge, the other being broken and reworked to form an irregular shape. The complete edge is sharp and slightly sinuous. Maximum width occurs at the shoulders which are pronounced on one side and broken on the other. Broad corner notches produce an expanding stem. The base is straight and has been thinned. Stem edges are sharp. This point has been broken at the tip and reworked along this surface. One large flake scar originates at the tip break and extends below the shoulders. The cross section is plano-convex.

Comments: This specimen resembles examples of the *Yarbrough* type.

References: Bell 1960: 98, Pl. 49; Suhm and Jelks 1962: 261, Pl. 131.

01-01-02M N=2: 2 Fragmentary (Fig. 54 j).

Both specimens are broken at the juncture of the stem and blade, and shoulder treatment is not apparent. Stems are expanding and bases deeply concave. Tangs are well defined and rounded. Broad basal notches have been removed as part of the stem preparation on each specimen. These fragments have a biconvex cross section and full stem edges.

Comments: These specimens resemble the hafting elements on points of the *Darl* type, but are also similar to *Frio* and *Uvalde* examples.

References: Bell 1960: 26, Pl. 13; 48, Pl. 24; 92, Pl. 46; Suhm and Jelks 1962; 179, Pl. 90; 195, Pl. 98; 255, Pl. 128.

Large Straight Stemmed Points *(01-01-04)*

01-01-04B N=1: 1 Fragmentary (Fig. 54 d).

This specimen is broken at the mid-section. Blade edges are slightly excurvate and sharp. Maximum width occurs at the shoulders. Shoulders are defined and stem edges are straight. The base is convex and all stem edges have been ground. A single, unpatinated flake scar has been removed from the blade suggesting that this point was secondarily deposited long after the date of manufacture and original use. The cross section is biconvex.

Comments: This point resembles specimens included in the *Morhiss* type.

References: Bell 1958; 58, Pl. 29; Suhm and Jelks 1962: 221, Pl. 111.

Large Unstemmed Points *(01-01-05)*

01-01-05A N=1: 1 Fragmentary (Fig. 54 h).

This specimen consists of the proximal (hafting element) segment of a large lanceolate point. A portion of the base as well as the tip and mid-section are missing. The basal area has an expanding outline and, except for a small area near the mid-section break, is heavily ground. This specimen has a biconvex cross section and presumably a concave base, but was too fragmentary for measurement.

Comments: This point fragment is patinated and is suggestive of lanceolate point forms found in Early Archaic/Paleo-Indian contexts.

Small Expanding Stemmed/Corner-Notched Points *(01-01-06)*

01-01-06A N=1: 1 Fragmentary (Fig. 54 i).

This point has been broken at the mid-section. Shoulder treatment is

Table 63. Summary of artifact categories and varieties from 34Pu-79.

Chipped Stone *(01)*

POINTS (01-00)
- Large Contracting Stemmed Points *(01-01)*
  - *01-01A*
- Large Expanding Stemmed/Corner-Notched Points *(01-02)*
  - *01-02C*
  - *01-02F*
  - *01-02J*
  - *01-02M*
- Large Straight Stemmed Points *(01-04)*
  - *01-04B*
- Large Unstemmed Points *(01-05)*
  - *01-05A*
- Small Expanding Stemmed/Corner-Notched Points *(01-06)*
  - *01-06A*

BIFACES (10-00)
- Cobble/Block Biface II/Thick Biface *(10-02)*
  - *10-02A*
- Thin Biface I *(10-03)*
  - *10-03A*

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)
- *12-01A*

MODIFIED FLAKES (13-00)
- *13-01B*

SPLIT/TESTED COBBLES (15-00)
- *15-01A*

DEBITAGE (16-00)
- *16-01A*

Fired Clay *(02)*

CERAMICS (01-00)
- Plain Grog, Grit, and Bone Tempered Wares *(01-01)*
  - *01-01A*
  - *01-01B*

BAKED CLAY (03-00)
- *03-01A*

Ground Stone *(03)*

MANOS (01-00)
- Unifacial Manos *(01-01)*
  - *01-01A*

GROUND HEMATITE (04-00)
- *04-01A*

Table 63. Continued

MISCELLANEOUS GROUND STONE IMPLEMENTS (06-00)
  Ground Stone Fragments *(06-03)*
    06-03A

Historic Debris *(07)*

GLASS (01-00)
    01-01A
    01-01B
    01-01C
    01-01D
    01-01E
    01-01F
    01-01G

CROCKERY/CERAMICS (02-00)
  Crockery *(02-01)*
    02-01A
  Ironstone/Porcelain *(02-02)*
    02-02A
    02-02B

METAL (03-00)
  Nails *(03-01)*
    03-01A
  Washers *(03-03)*
    03-03A
  Cartridges *(03-06)*
    03-06A
    03-06B
  Miscellaneous Metal Items *(03-09)*
    03-09A
    03-09B
    03-09C

Faunal *(08)*

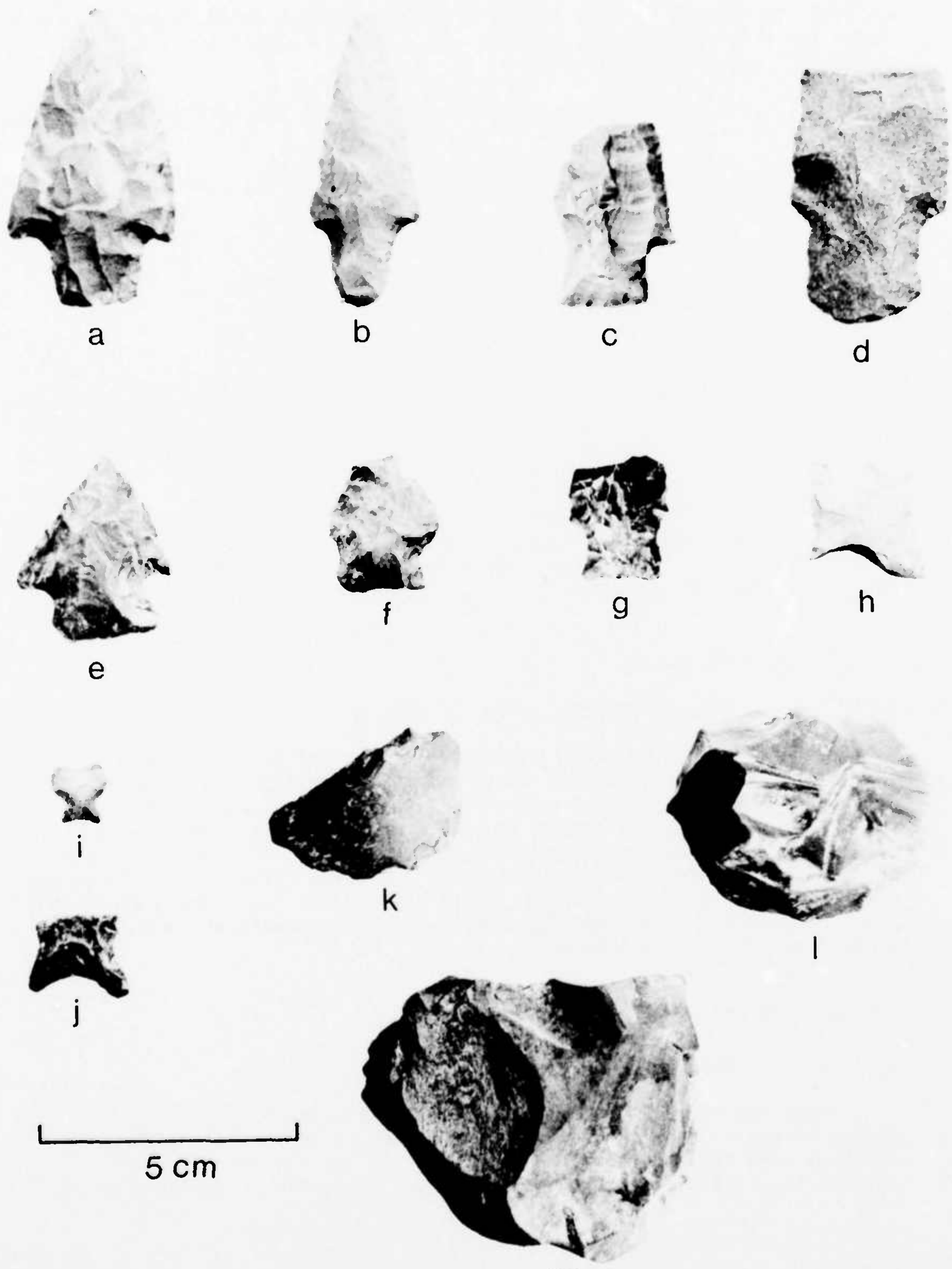
BONE/HORN/TEETH (01-00)
    01-01A

SHELL (02-00)
    02-01A

Floral *(09)*

Fig. 54. Selected chipped stone artifacts from the Jock Standefer site (34Pu-79).

a-b:	*01-01-01A*
c:	*01-01-02J*
d:	*01-01-04B*
e-f:	*01-01-02F*
g:	*01-01-02C*
h:	*01-01-05A*
i:	*01-01-06A*
j:	*01-01-02M*
k:	*01-13-01B*
l-m:	*01-10-02A*


a
b
c
d
e
f
g
h
i
k
l
j
5 cm
m

defined and rounded. Broad corner notches produce a small, expanding stem. Tangs are well defined and pointed. The base is concave and the cross section is plano-convex.

Comments: This point fragment resembles specimens included in the *Scallorn* type.

References: Bell 1960: 84, Pl. 42; Suhm and Jelks 1962: 285, Pl. 143.

BIFACES (10-00)

Cobble/Block Biface II/Thick Biface *(01-10-02)*

01-10-02A N=10: 10 Complete (Fig. 54 l-m).

Specimens included in this category exhibit the following characteristics: ovate (7) to amorphous (3) outlines; sinuous edges; thick, biconvex (7) and plano-convex (3) cross sections; large and random collateral flake scars; and cortex remnants covering less than 50% of the total surface. Three specimens exhibit small flake series along lateral edges and may possibly have been used at this stage of reduction. In general, these items are considered to reflect primary modification activities in the lithic reduction sequence. All raw materials in this category are locally derived from cobble gravels.

Thin Biface I *(01-10-03)*

01-10-03A N=5: 5 Complete (Fig. 55 a-b).

Bifaces in this category exhibit no cortex and have been thinned in varying degrees. Outlines are ovate and cross sections are biconvex (3) and plano-convex (2). Large collateral flake scars extend across both faces of these items reflecting several thinning series. Minor shaping, represented by smaller collateral flake series, is also apparent on these bifaces. Both locally available cobbles and large flakes appear to be the parent forms of these specimens. These bifaces may have been used at this stage of reduction but probably represent primary modification in the general manufactural sequence.

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)

01-12-01A N=77

These are miscellaneous, unclassifiable specimens that reflect varying stages of completion. An undetermined number of items included in this category were probably broken during use. Of the specimens in this category, 19% are tip, 12% mid-section, and 32% basal fragments. Completed point

Table 64. Metric attributes for selected chipped stone varieties from 34Pu-79.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-01A					
$\bar{x}$	56.0	26.9	8.2	15.0	14.9
s.d.	0.1	5.9	3.6	1.8	2.5
range	55.9-56.1	21.0-32.8	6.3-10.8	12.5-16.5	13.0-18.4
N	2	2	3	3	3
01-01-02A					
$\bar{x}$	34.7	25.3	7.5	9.3	18.2
s.d.	-	4.3	0.9	2.7	2.9
range	-	21.0-29.6	6.2-8.2	5.8-12.3	15.2-22.2
N	1	2	3	3	3
01-01-02J					
$\bar{x}$	-	-	7.5	11.0	17.0
N	-	-	1	1	1
01-01-04B					
$\bar{x}$	-	29.8	9.1	18.2	20.8
N	-	1	1	1	1
01-01-06A					
$\bar{x}$	-	-	3.6	4.0	5.7
N	-	-	1	1	1
01-10-02A					
$\bar{x}$	47.1	38.8	23.0	-	-
s.d.	9.9	6.3	8.3	-	-
range	34.0-61.7	28.4-52.0	14.5-44.1	-	-
N	10	10	10	-	-
01-10-03A					
$\bar{x}$	50.3	38.4	17.2	-	-
s.d.	4.6	5.9	4.3	-	-
range	42.9-57.3	29.9-44.9	9.7-22.2	-	-
N	5	5	5	-	-

forms are represented by at least 13% of the total sample, and probably are fragments of large point varieties.

MODIFIED FLAKES (13-00)

01-13-01B N=78 (Fig. 54 k).

This category includes lithic flakes, chips, and blocky shatter that exhibit unifacial modification of one or more margin. The processes responsible for edge modification are probably diverse but most likely include utilized specimens. No attempt has been made to discern functional flake tool categories.

SPLIT/TESTED COBBLES (15-00)

Tested Cobbles *(01-15-02)*

01-15-02A N=4: 4 Complete (Fig. 55 c).

The specimens in this category exhibit a small number of flake scars, and retain over 50% of their original cortical surfaces. These specimens presumably represent the "testing" of cobble materials, and reflect procurement activities in the reduction sequence. No indications of use were observed on these specimens.

DEBITAGE (16-00)

01-16-01A N=9930

All unmodified lithic debris from the site is included in this category. A breakdown of lithic types derived from the analysis of flakes from two squares at the site is presented in tabular form below (Table 65). The distribution of flakes at the site is presented by level and square in Table 68.

Fired Clay *(02)*

CERAMICS (01-00)

Plain Grog, Grit, and Bone Tempered Wares *(02-01-01)*

02-01-01A N=1: 1 Body sherd

Definition: This plainware variety is thick and coarsely textured and characterized by predominantly grog and grit temper. Other definitions of this plainware variety are provided by Brown (1971), Galm (1978b), and Galm and Flynn (1978).

Table 65. Horizontal and vertical distribution of lithic debitage by material type from two squares at 34Pu-79.

Provenience (Square:Level)	Lithic Type A	B	C	D	E	F	G	H	I	J	K	Total	%
A48-24:													
1(0-10 cm)	352	33	1	20	-	3	1	30	-	64	4	508	50
2(10-20 cm)	320	25	-	13	3	-	4	41	-	42	4	452	44
3(20-30 cm)	57	1	-	1	-	-	2	2	-	2	-	65	6
Total	729	59	1	34	3	3	7	73	-	108	8	1025	
%	71	6	<.1	3	.2	.2	.7	7	-	11	.8		100%
A55-12													
1(0-10 cm)	163	16	-	5	-	-	-	17	1	12	-	214	51
2(10-20 cm)	112	5	-	3	2	-	1	8	-	21	3	155	37
3(20-30 cm)	26	3	-	-	-	-	-	2	-	9	-	40	10
4(30-40 cm)	4	-	-	-	-	-	-	1	-	2	-	7	2
Total	305	24	-	8	2	-	1	28	1	44	3	416	
%	73	6	-	1.9	.4	-	.2	7	.2	10.6	.7		100%

Method of Manufacture: Coiling.

Paste:

Texture: Very coarse.

Surface Treatment: Exterior and interior surfaces are smoothed and uneven.

Color:

Exterior: 7.5YR 5/6, strong brown.

Interior: 7.5YR 3/2, dark brown.

Core: Zoned; brown-black-brown.

Thickness: 13.5 mm.

Form: Body sherd.

Minimum Vessel Count: 1.

Comments: *Williams Plain* is a common utilitarian ceramic variety found throughout eastern Oklahoma and adjacent areas.

02-01-01B N=1 : 1 Body sherd (reconstructed from 7 sherds) (Fig. 55 d).

Definition: The plainware variety *LeFlore Plain* resembles *Williams Plain* but is generally thinner, has less grog tempering inclusions, and a finer texture. Its distribution may parallel that of *Williams Plain*.

Method of Manufacture: Coiling.

Paste: Compact with angular grog and grit inclusions.

Surface Treatment: Exterior and interior surfaces are smoothed and uneven.

Color:

Exterior: 10YR 4/3, dark brown.

Interior: 10YR 3/3, dark brown.

Core: 10YR 2/1, black.

Thickness: 7.7 mm.

Form: Body sherd.

Minimum Vessel Count: 1.

<u>Comments</u>: This plainware variety has been recognized throughout eastern Oklahoma and appears to date later than the earliest introduction of *Williams Plain* in this area (Galm and Flynn 1978).

BAKED CLAY (03-00)

02-03-01A N=2

Amorphous chunks of burned clay containing angular gravel fragments and organic debris. These specimens may relate to modern cultural activity at the site.

Ground Stone *(03)*

MANOS (01-00)

Unifacial Manos *(03-01-01)*

03-01-01A N=1: 1 Fragmentary (Fig. 55 f).

This specimen is ground on one face. It is generally ovate in outline, measuring 86 mm in width and 51 mm in thickness. It is made of well cemented and rounded sandstone. In addition, two small areas on the surface opposite the grinding exhibit some battering/pecking suggesting use as a hammerstone.

GROUND HEMATITE (04-00)

03-04-01A N=2: 2 Fragmentary (Fig. 55 e).

Included in this category are two small clay/siltstone cobbles that have an outer casing of hematite which has been ground along the edges. The outer hematite casing has broken off over portions of both specimens and it is not known how much of each specimen was originally worked. These specimens range in size from 56.3-58 mm (length) to 35-36 mm (width) to 23.24.6 mm (thickness). Both cobbles were probably obtained locally. It is not known how or for what purpose these items were used.

MISCELLANEOUS GROUND STONE IMPLEMENTS (06-00)

Ground Stone Fragments *(03-06-03)*

03-06-03A N=2

Included in this category are two miscellaneous, unclassifiable ground sandstone cobble fragments. Ground areas are restricted to one face on each specimen.

Historic Debris *(07)*

GLASS (01-00)

07-01-01A N=65

Amorphous fragments of clear window and bottle glass. Pieces range up to a maximum thickness of 5 mm.

07-01-01B N=2

Small, amorphous fragments of blue-tinted, clear glass.

07-01-01C N=2

Small, amorphous fragments of "purpled" (translucent) glass. These are most likely bottle fragments.

07-01-01D N=2

Small, amorphous fragments of brown translucent glass.

07-01-01E N=3

These are small fragments of opaque milk-white glass. Two fragments have grooves on one face and may be part of the bottom of a vessel or vessels.

07-01-01F N=2

The two opaque green glass fragments in this category are part of a bowl that had a rolled lip and everted rim.

07-01-01G N=1

This single fragment is a neck and lip segment of opaque, green bottle glass. A seam is present on the exterior surface.

CROCKERY/CERAMICS (02-00)

Crockery *(07-02-01)*

07-02-01A N=1

Plain crockery fragment with glazed exterior and interior surfaces. One side is dark brown in color, the other is white.

Ironstone/Porcelain *(07-02-02)*

07-02-02A N=3 (Fig. 55 g).

Glazed earthenware ceramics with blue "feather edge" pattern along rim.

07-02-02B N=6

Plain whiteware ceramic fragments with glazed exterior and interior surfaces. One fragmentary base sherd from a cup is present in this sample.

METAL (03-00)

Nails *(07-03-01)*

07-03-01A N=26+

Round wire nails. These specimens are badly corroded and constitute over 300g of general nail debris.

Washers *(07-03-03)*

07-03-03A N=2

Two flat metal washers measuring 11 mm and 12.8 mm in diameter. The central holes measure 4 mm in diameter.

Cartridges *(07-03-06)*

07-03-06A N=1 (Fig. 55 h).

This is a brass .303 Savage cartridge casing, headstamped "WRA" (Winchester Repeating Arms). This is an externally primed cartridge.

Fig. 55. Selected chipped and ground stone artifacts, ceramics, and historic debris from the Jock Standefer site (34Pu-79).

b: *01-10-03A*

c: *01-15-02A*

d: *02-01-01B*

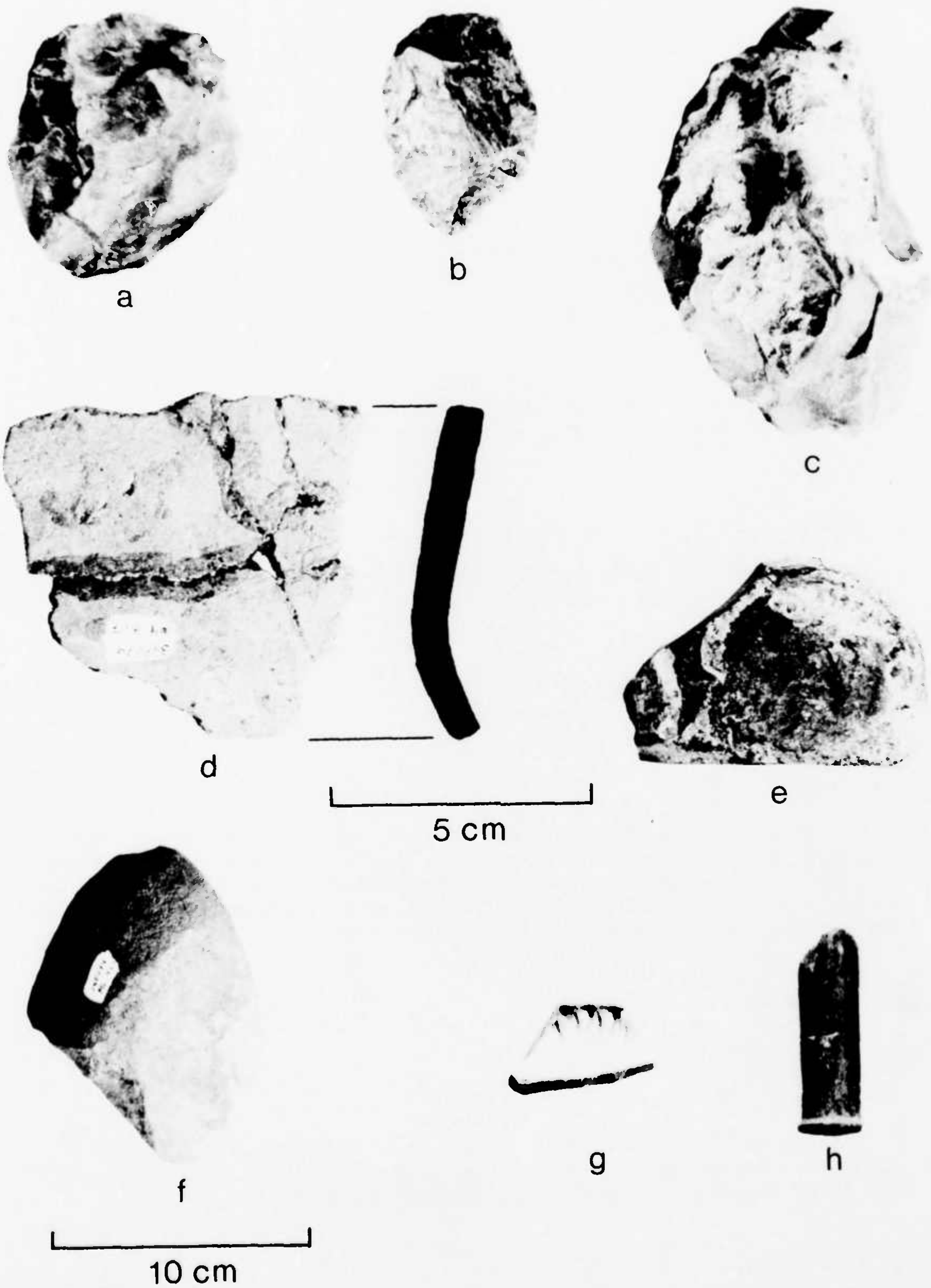
e: *03-04-01A*

f: *03-01-01A*

g: *07-02-02A*

h: *07-03-06A*

Note: Artifact f is shown at 10 cm scale. Cross section drawn with vessel exterior to the left.


a
b
c
d
e
5 cm
f
g
h
10 cm

07-03-06B N=1

This is a .22 short brass cartridge, headstamped "U", manufactured by Union Metallic Cartridge Co. (later the Remington Arms Co.).

Miscellaneous Metal Items *(07-03-09)*

07-03-09A N=1

Included in this variety is a square head, threaded iron bolt. The dimensions of the bolt are: length 85 mm; shaft diameter 15.5 mm; head width 22 mm. The threaded portion of the bolt extends 23 mm up the shaft. The bolt is badly rusted and all measurements are approximate.

07-03-09B N=1

This is a metal snap fastener with a stylized "W" stamped on the outer surface. The maker is unknown but this is probably from an article of clothing.

07-03-09C

Miscellaneous, unidentifiable metal scraps. All of the fragments in this group are badly corroded iron.

Faunal *(08)*

BONE/HORN/TEETH (01-00)

08-01-01A N=1

A single, fragmentary long bone was recovered from the site. This specimen is probably the distal end of a humerus from a white-tailed deer *(Odocoileus virginianus)* although the fragmentary nature of the bone prevented a positive identification. This is most likely a modern intrusion and not part of prehistoric activity at the site.

SHELL (02-00)

Mollusc *(08-02-01)*

08-02-01A N=3

Three small, unidentifiable mussel shell fragments are included in this category. One specimen resembles the three-ridge mussel *(Amblema costata)*. All three fragments are most likely modern intrusions.

DISCUSSION AND INTERPRETATIONS

Cultural debris from the Standefer site reaffirms the disturbed nature of a significant portion of the cultural deposit. The type and degree of disturbances have thereby limited attempts to provide a meaningful analysis. Disturbances are most apparent in the northwest quadrant of the site (Fig.51) and include home and outbuilding construction and an attendant period of occupation. The distribution of cultural remains at the site has been provided by square to isolate disturbed areas, as well as the location of greatest prehistoric activity (Tables 66 and 67). A review of the distribution of historic debris (Table 67) indicates that squares TS-1, TS-2, and A46-15 are badly disturbed by recent activity on the site. Further examination of Table 1 reveals that these same three squares contain over 44% of all chipped stone implements from the site. In addition, the disturbed squares contain over 43% of all recovered lithic debitage (Table 68). How so much cultural debris came to be concentrated in squares TS-1, TS-2, and A46-15 is not fully understood, although as indicated above, land surface alterations clearly played an important part in this process. In view of the questionable contexts of these test units, further consideration of associated cultural debris would serve little purpose.

The remaining squares on the site produced varying, but moderate amounts of cultural debris, most of which is concentrated in Levels 1 and 2 (0-20 cm). Biface varieties (*01-10-02A* and *01-10-03A)* and biface/point fragments and segments *(01-12-01A)* dominate chipped stone items from the site. Points are limited to 15 complete and fragmentary specimens, or approximately 8% of the chipped stone implement sample. Of this number, nearly half (47%) were recovered from disturbed squares TS-1 and A46-15.

Consideration of cultural chronology at the site given the available data is difficult at best. No radiocarbon dates were obtained on the site deposit as charcoal was scarce and often occurred (>33% of the recovered sample) in disturbed contexts. Cultural debris that might be considered "diagnostic" and provide a relative chronology is extremely limited in number. Previous suggestions that the site contains Late Archaic and/or Woodland period occupations (Bobalik 1977: 304-306) are not seriously challenged by the present findings. Indications of a relatively late-dating component or components are limited to a single small (arrow) point form (*01-01-06A)* and two sherds from the site. Sample sizes in general are too small to adequately address the question of multi-componency at 34Pu-79. The earliest date of the latest occupation on the site has not been determined, but historic debris and structural remains indicate that the area was occupied until very recently.

Site function, and to a large extent, site significance, can only be assessed in very general terms. Activities performed on the site most likely include, but are not limited to, lithic implement manufacture and maintenance, minor extractive activities, and perhaps, an attendant set or sets of habitation-related activities. Patterns of breakage, edge

Table 66. Horizontal and vertical distribution of cultural remains from 34Pu-79.

Provenience (Square:Level) (10 cm)	01-01-01A	01-01-01C	01-01-01F	01-01-01J	01-01-01M	01-01-04B	01-01-05A	01-01-06A	01-10-02A	01-10-03A	01-12-01A	01-13-01B	01-15-01A	02-01-01A	02-01-01B	03-01-01A	03-04-01A	03-06-03A	08-01-01A	08-02-01A	Total
A17-19																					
1												1									1
2									1												1
A21-24																					
1											4	1									5
2											2	1									3
4												1									1
A31-3																					
2											1										1
3			2									1									3
4												2									2
A42-5																					
1											1										1
2											2		1								3
3											5	3									8
A46-15																					
1											3	3									6
2		1									3										4
3											3	2	1								6
4									1		3	7						1			12
5	1									1	6	7									15
6											2	2									4
7												2									2
8												1									1
9												1									1
A48-24																					
1			1								3	4									8
2									1	2	6	8			1						18
3											1	1									2
A50-12																					
2				1	2						5	4									12
3	1										1										2
4			1						1												2
5																	2				2
A52-6																					
1									1		2	1									4
2											1	1									2
A55-12																					
1									1			2				1					4
A61-20																					
1											2										2
2												1									1
A62-10																					
1											1	1									2
A64-18																					
1											1										1
B43-4																					
1												2									2
2												2						1			3
3												3									3
4									1												1
5										1											1
7												1									1
T5-1																					
1	1						1		1		7	5		1							16
2	1							1	1		3	1									7
4											2	1									3
5											2	1	1								4
6												2	1								3
7						1				1											2
T5-2																					
1												1								1	2
2											2	1							1	2	6
3									1												1
Surface											3										3
Total	4	1	4	1	2	1	1	1	10	5	77	78	4	1	1	1	2	2	1	3	200

Table 67. Horizontal and vertical distribution of historic debris from 34 Pu-79.

Provenience (Square:Level)	07-01-01A	07-01-01B	07-01-01C	07-01-01D	07-01-01E	07-01-01F	07-01-01G	07-02-02A	07-02-02B	07-02-02C	07-03-01A	07-03-03A	07-03-06A	07-03-06B	07-03-09A	07-03-09B	07-03-09C
A17-19																	
1												1					
A21-24																	
1												1					
A31-3																	
1	1																
A42-5																	
2											1			1			
A46-15																	
1									1		1						11.7g
3																	
5										1							4.2g
7																	8.2g
8																	
A48-24																	
1	2																
A50-12																	
2								2									
A52-6																	
1											1						
D33-12																	
2	1																
TS-1																	
1	5	2	2	1	2						3						9.2g
2	1								1								7.0g.
TS-2																	
1	51					2	1		1		224.7g		1	1		1	52.6g
2	4			1	1			1	3						1		
Total	65	2	2	2	3	2	1	3	6	1	230.7	2	1	1	1	1	92.9g

Table 68. Horizontal and vertical distribution of lithic flakes from 34Pu-79.

	Arbitrary Levels (10 cm)										
Square	1	2	3	4	5	6	7	8	9	Total	%
A17-19	31	84	27	3	-	-	-	-	-	145	1.4
A21-24	168	165	87	19	-	-	-	-	-	439	4.4
A31-3	111	249	67	12	-	-	-	-	-	439	4.4
A42-5	180	317	191	26	-	-	-	-	-	714	7.1
A46-15	108	570	395	472	433	291	158	98	14	2539	25.5
A48-24	519	452	66	-	-	-	-	-	-	1037	10.4
A50-12	91	480	232	116	4	-	-	-	-	923	9.2
A52-6	126	90	20	-	-	-	-	-	-	236	2.3
A55-12	216	156	40	7	-	-	-	-	-	419	4.2
A61-20	114	45	1	-	-	-	-	-	-	160	2.0
A62-10	82	102	19	-	-	-	-	-	-	203	2.0
A64-18	120	9	-	-	-	-	-	-	-	129	1.2
B43-4	133	200	147	84	94	64	16	-	-	738	7.4
D22-17	8	12	-	-	-	-	-	-	-	20	.2
D33-12	4	22	10	-	-	-	-	-	-	36	.3
T-1	472	398	240	187	123	109	35	-	-	1564	16.0
T-2	45	128	16	-	-	-	-	-	-	189	2.0
Total	2528	3479	1558	926	654	464	209	98	14	9930	
%	25.4	35	15.6	9.3	7	4.6	2.1	.9	.1		100%

attrition/wear, and reworking in the lithic implement sample, combined with the manufactural stages represented in the flake debris sample, are highly suggestive of on-site utilization of points and certain other chipped stone specimens. Lithic type data indicate a consistent reliance on locally available cherts, primarily Type A (Table 65). There is very little in the site collection as a whole that suggests significant interaction with surrounding regions. The kinds and amounts of cultural debris recovered from 34Pu-79 are indicative of short-term occupations or encampments. It is conceivable therefore, that the site served as a short-term bivouac or base camp area and was occupied at only selected intervals during the year. The position of the site along Jackfork Creek would have afforded easy access to both upstream and downstream areas of the valley and makes this one of the closest recorded sites to the confluence of Jackfork and Anderson creeks.

The degree of modern disturbances at 34Pu-79 limits future research potential and is a primary consideration in not recommending the site for further investigations during Phase II. Portions of the site, particularly the westernmost area (Fig.51), appear to be relatively undisturbed, but yielded little new information regarding the nature or duration of occupations on the site. Further consideration of site significance will rest on refinement of the data presented to date, as additional investigations at this locale cannot be justified.

CHAPTER 13

PHASE I EXCAVATIONS AT THE ARROWHEAD HILL SITE (34Pu-105)

Rain Vehik

INTRODUCTION

Test excavations were conducted in September 1978 on property leased by Jack Tucker of Finley, Oklahoma. The site is on an old stream terrace with an approximate elevation of 574 feet (175 m) and is about 165 m east of the present course of Buffalo Creek. Old meander scars are visible on all sides of the site and two oxbows parallel its west edge. This area, previously cultivated, is currently being used as a pasture. Stands of scrub oak occur sporadically along the eastern edge and compose the gallery forest leading west to Buffalo Creek (Fig. 56a).

The site was located in 1972, and associated material included one core and 23 utilized and unutilized flakes (Neal 1972: 16). Based on recommendations by Neal (1972: 16), the site was tested in 1976 (Bobalik 1977: 517-554). This work consisted of post hole testing at 15 m and 30 m intervals along four transect lines and nine post hole tests which were randomly placed across the site. Depths of these tests ranged between 33-68 cm below ground surface. These tests also suggested that the site covers an area of at least 100 m by 180 m (Bobalik 1977: 518). In addition, three 1 m squares were excavated to a depth of 50 cm (Bobalik 1977: 519). Materials found included pebble/cobble bifaces, thick bifaces, stemmed and unstemmed thin bifaces, utilized and unutilized flakes, ground stone, ceramics, burned and unburned bone, and burned clay (Bobalik 1977: 525, Table 267). One cultural feature consisting of a compact carbon stained matrix was also located. Lumps of burned clay, burned bone, wood charcoal, sandstone which may be thermally altered, and 11 potsherds were associated with it (Bobalik 1977: 519-523). Charcoal found at a depth of 20-30 cm in the feature has been dated at A.D. 1100 ±75 (Bobalik 1977: 523).

On the basis of artifact analyses and comparisons, Bobalik (1977: 549-554) suggests a possible Late Archaic and an early Caddoan component. It was also indicated that the site may have been a base camp at which hunting, lithic reduction, and storage and processing of floral resources were important activities.

It was decided that additional excavations be conducted in order to ascertain the relationship of the feature to the remainder of the site. Also the relatively late date associated with the feature indicated that the site was occupied during late prehistoric times, and provided an opportunity to study its relationship to similar sites. Finally, if the hypothesis that the site represents a base camp is accepted it is possible

that structures could be located, and would provide additional data on settlement patterns in the interior Ouachita Mountains.

EXCAVATION STRATEGIES

The 1976 test excavations indicated that heaviest densities of cultural materials were along the western portion of the site (Bobalik 1977: 518). Part of this area, adjacent to an oxbow, is a mound-like area covered with scrub oak and may not have been disturbed by cultivation. Therefore, a 40 m^2 block (Block A) was transposed over this area and 12 randomly selected 1 m squares were chosen for excavation (Fig. 57). Four additional 1 m squares were excavated in order to more fully expose cultural features. One of these (B50-7) was to test the southern mound-like area in which a feature had been located in 1976.

Also one control square (A58-10) was nonrandomly selected and excavated in 12 five centimeter arbitrary levels. The entire matrix of this square was waterscreened through 1/16-inch hardware cloth. The remainder of the squares (59 levels) were excavated in 10 cm arbitrary levels, and screened through ¼-inch hardware cloth.

Rock features were exposed as a unit before the rocks were removed but soil changes (expecially cultural features) were cross sectioned if possible, and the soil was saved for flotation. In some instances, features extended into adjacent squares and these, if time permitted, were excavated to at least the depth of the feature in order to determine its outline and size.

Excavations were terminated at varying depths associated with strata IV and V throughout the site and depended on a noticeable decrease in the amount of cultural material recovered. For example, in one square no materials were recovered and excavations were terminated at the bottom of Level 3. In six units, three, two, one, eight, three, and four flakes respectively were recovered in the last excavation level. In five squares the final level consisted of excavating only half the square. This strategy was used, mostly because of the compactness of the soil to test whether significant amounts of cultural remains occurred beneath the last fully excavated level. If less than 10 flakes and no artifacts were located excavations were terminated in these squares. All squares were backfilled at the end of the excavation program.

In summary, 61 full and four half levels were excavated in 10 cm arbitrary levels in 16 squares. In addition, 12 levels in one square were excavated in 5 cm arbitrary levels and were waterscreened through 1/16-inch hardware cloth.

STRATIGRAPHY

Five strata were identified (Figs. 56; 58). For the most part, these consisted of variations of silt loam. Color designations are derived from moist samples using Munsell soil color charts (Munsell 1975), and

Fig. 56. a: General view of south part of the Arrowhead Hill site (34Pu-105).

b: Stratigraphic profile of A20-22. Feature 78-2 at upper left.

a

b

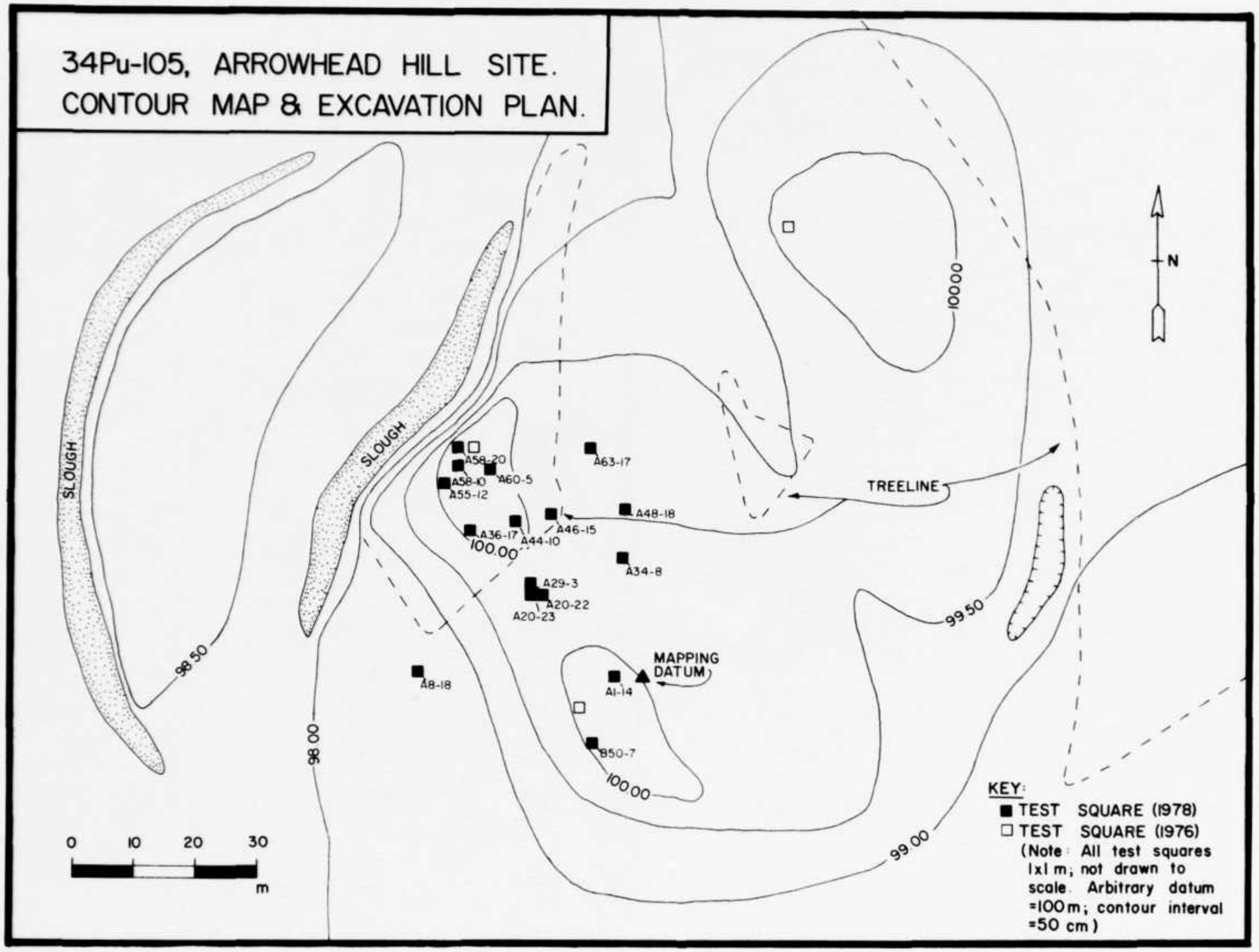
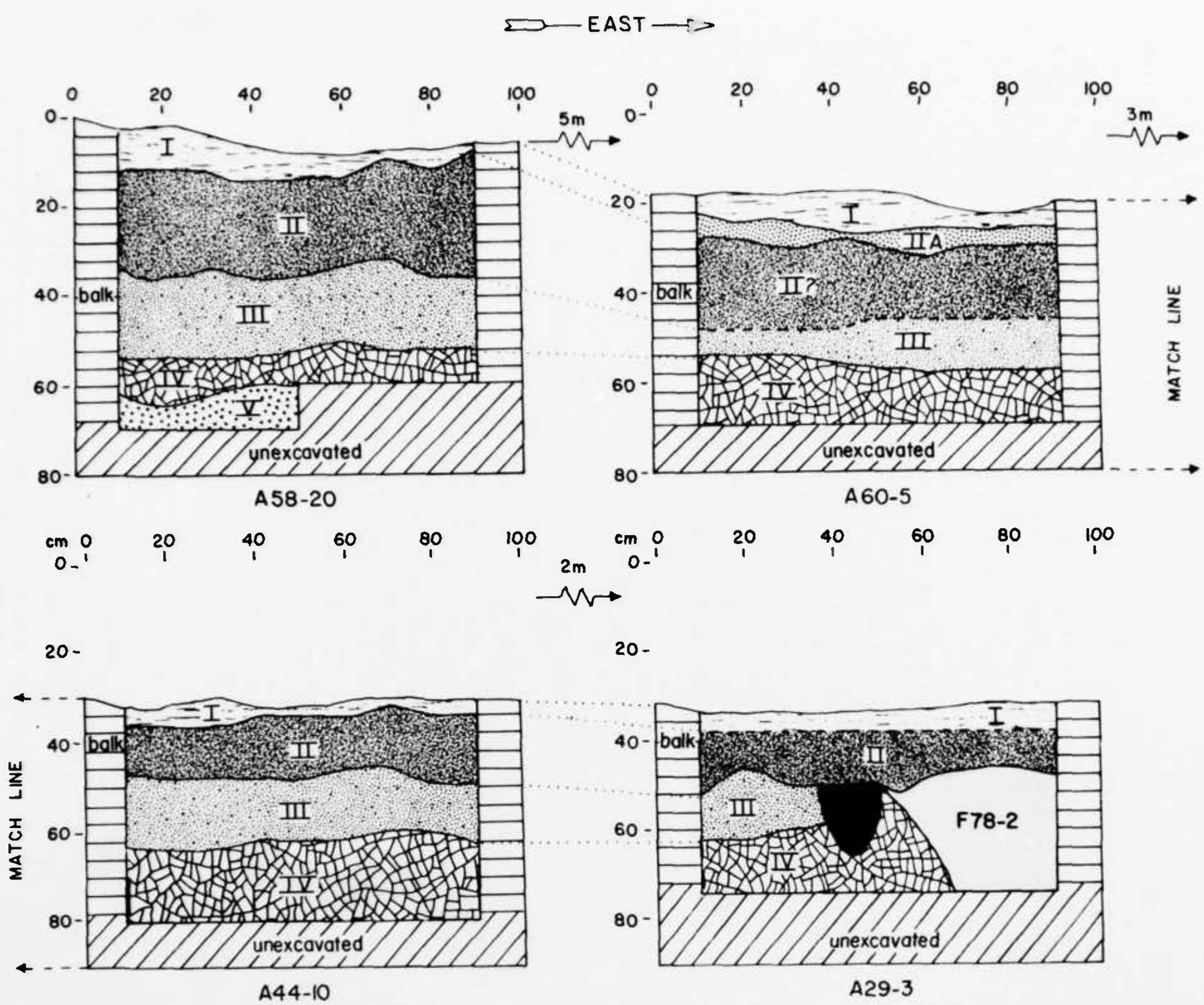


Fig. 57. Map showing contours and excavation plan at the Arrowhead Hill site (34Pu-105).



34Pu-105. STRATIGRAPHIC PROFILES.

Fig. 58. Stratigraphic profiles of test units at the Arrowhead Hill site (34Pu-105).

depth measurements are the depth of strata boundaries below ground surface (Soil Survey Staff 1962: 186).

Stratum I

This stratum represents the uppermost strata at the site and ranges between 1-9 cm in thickness with an average of 3.7 cm. It is composed of a loose silt loam. Decomposed leaves and roots ranging in size from fine to large are common. Colors vary from dark yellowish brown (10YR 3/4) to very dark grayish brown (10YR 3/2). The most common color is dark brown (10YR 3/3). Cultural materials are abundant.

Stratum II

Stratum II is composed of dark brown (10YR 3/3) to dark yellowish brown (10YR 3/4) compact silt loam sediments. These in some cases, are friable and break in blocky peds. Small amounts of sandstone, fine to moderate size roots, and black, brown, and red hematite flecks are scattered throughout this stratum. It varies between 1-10 cm in depth and is 4-28 cm thick. The average thickness is 15.8 cm. Cultural materials are plentiful.

Stratum III

This stratum is composed of a homogenous, compact silt loam which often breaks in blocky peds. Interspersed throughout it are charcoal flecks, possible hematite flecks, fragmentary pieces of bone, sandstone, and a few moderate size roots. Some rodent disturbance was noted in one square. It has a depth of 6-32 cm, and ranges in thickness between 2-28 cm with an average thickness of 20.9 cm. Predominant colors vary between dark brown (10YR 2/2), dark yellowish brown (10YR 4/6), strong brown (7.5YR 4/6), and very dark grayish brown (10YR 3/2). In some squares the interface between Strata III and IV is not clearly demarcated. Stratum III tends to be less sandy and slightly more compact. Cultural materials are not as abundant as in the preceeding strata.

Stratum IV

This stratum ranges in depth between 25 cm and 50 cm and in thickness between 1-31 cm with an average of 12.9 cm. It is characterized by a very compact, homogenous silt loam, high clay content, and breaks in blocky peds. Black and red hematite and/or charcoal flecks are interspersed throughout the sediments, and at least in one instance a large root was encountered. Colors vary between strong brown (7.5YR 4/6) and dark yellowish brown (10YR 4/6). The amount of cultural materials drops significantly in this unit.

Stratum V

This stratum was encountered in only three squares (A55-12, 58-20, and B50-7). It represents the deepest stratum, ranging in depth between 41-62 cm. It is characterized by an extremely compact silt loam with a high clay content and breaks in blocky peds. It is at least 15 cm thick, and ranges in color from strong brown (7.5YR 4/6) to dark brown (10YR 4/4). Cultural materials are scarce.

FEATURES

Four feature numbers were assigned during the 1978 season. Features located and recorded fall into two classes: pits and rock concentrations.

Pits

Feature 78-2

This feature, in the southeast corner of A29-3, also extends into A20-22 and 20-23 (Fig.59). It appears to be circular in outline and has a diameter of approximately 72 *cm*. The diameter is larger at the orifice and tapers inward at the bottom. The feature, first noted 15 cm below ground surface, has a depth of 30 cm. The fill is slightly compact, medium to very dark brown (10YR 4/2-2/2) sandy loam. It apparently contains more organic material than the adjacent sediments. It is surrounded by an area of more compact silt loam which has a yellowish brown color (10YR 5/4). South of these is an area of mottled dark yellowish brown (10YR 4/6) sediments which occur in strata adjacent to and beneath the feature. These may represent soil removed from the pit during construction. Associated material includes one piece of pottery *(02-01-01)*, a thin biface IIa *(01-10-04A)*, flakes, and several angular rocks at the bottom of the feature.

Feature 78-4

This feature may represent a pit or post hole. It is in the northeast corner of A20-22, approximately 50 cm east of Feature 78-2 (Fig.59). It was first noted in the profile at a depth of 25 cm and extends to a depth of at least 52 cm. The feature expands toward the top and measures approximately 18 cm north-south and 10 cm east-west. Its matrix consists of a moderately compact dark brown (10YR 3/3) silt loam which is slightly mottled and contains fine roots. The surrounding sediments are a mottled dark yellowish brown (10YR 3/4) compact silt loam. There are no definitely associated cultural materials, however charcoal flecks were in the matrix around the feature.

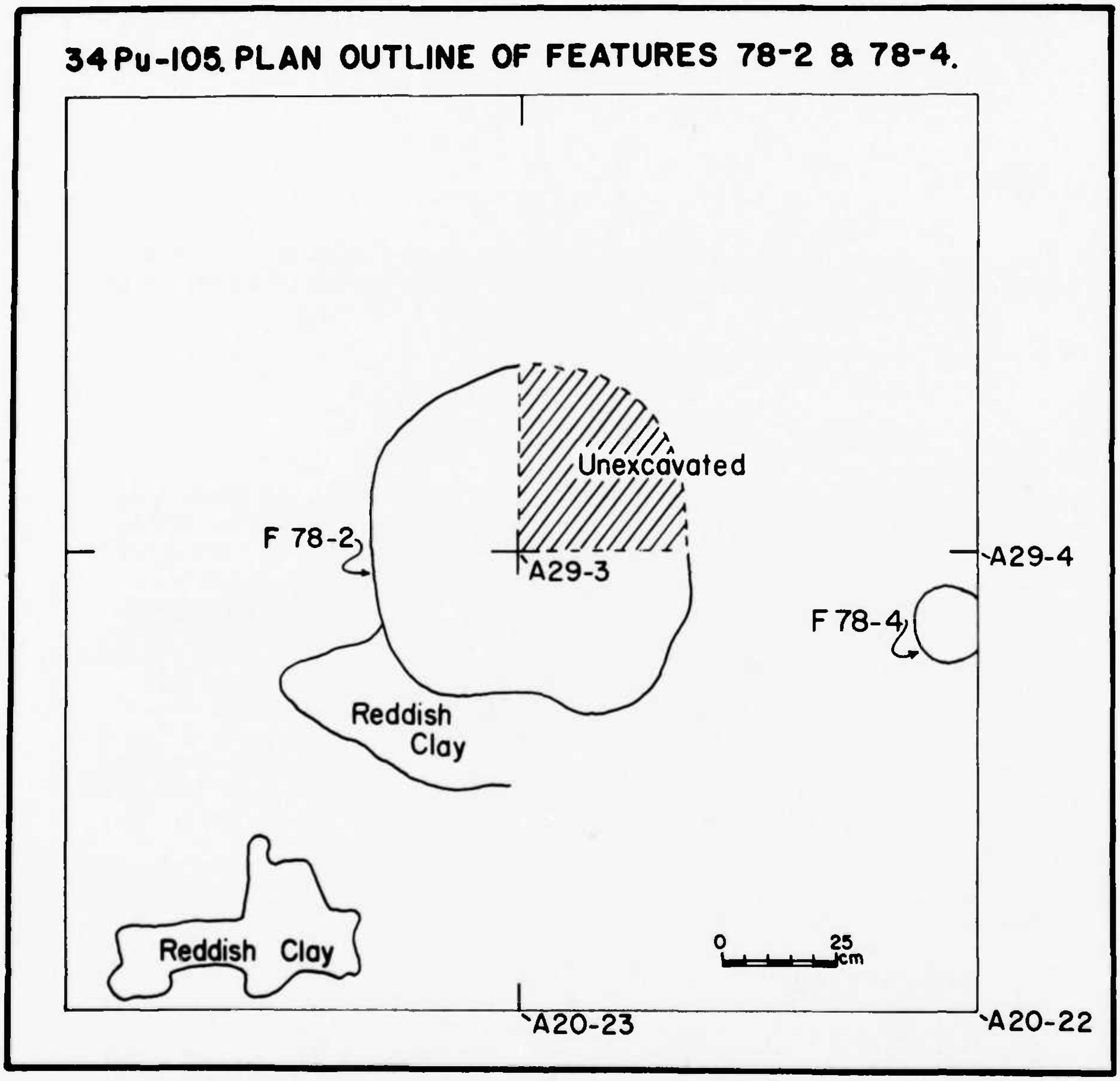


Fig. 59. Plan outline of features 78-2 and 78-3 at the Arrowhead Hill site (34Pu-105).

Flotation samples were saved from both features, but as indicated in Appendix B no significant cultural materials were recovered from them.

Rock Concentrations

Feature 78-1

This feature, in the northwest quadrant of A44-10, was first encountered at a depth of 18 cm and appears to extend to a depth of 39 cm. It is composed of a scatter of rocks which may extend into adjacent squares but these were not excavated. The rocks appear to be cryptocrystalline and sandstone and range from rounded to angular. The matrix surrounding the rocks is a compact silt loam containing flecks of charcoal and small pieces of baked clay. This suggests that some burning occurred nearby which may be associated with the feature. Associated material, in the same level, include a cobble/quarried block biface I *(01-10-01A)*, a split cobble *(01-15-01A)*, biface fragments *(01-12-01A)*, a thin biface I *(01-10-03A)*, a mano *(03-01-01)*, and flakes *(01-16-01A)*.

Feature 78-3

This feature is a semicircle of rocks in the northwest quarter of A58-20. It is between 38 cm and 48 cm below ground surface. For the most part the rocks are angular, sandstone and cryptocrystalline, and have a length of approximately 8-10 cm. The surrounding sediments are a dark grayish brown silt loam containing flecks of charcoal, burned clay, and possibly bone and ash. The feature measures 58 cm north-south and 36 cm east-west. No cultural materials were directly associated with the feature, but materials found in Levels 4 and 5 include bifaces *(01-10-00)*, a contracting stemmed point *(01-01-01A)*, flakes *(01-16-01A)*, and one piece of quartz.

RADIOCARBON DATES

Two charcoal samples were submitted for radiometric dating to the Center for Applied Isotope Studies at the University of Georgia. The results are presented below in a summary form. Corrected dates, obtained by following Ralph, Michael, and Han (1973) and Damon, Ferguson, Long, and Wallick (1974) are also presented. However, throughout the report reference will be made only to the uncorrected calendrical dates based on a half life of 5730 years.

UGa-2544 (Sample No. 34Pu-105-3):

Half Life 5568 = 1600 ±55 B.P.
Half Life 5730 = 1648 ±55 B.P.
Calendar Date = A.D. 302 ±55 (uncorrected)
Corrected Date = A.D. 390 ±65 (Ralph,et. al. 1973)

Corrected Date = A.D. 363 ±61 (Damon et. al. 1974)
Provenience = A44-10; Level 2, 10-20 cm below surface.
Material = 23.9 g of charcoal which may be associated with small pieces of bone. The surrounding matrix is a fine silt loam containing moderate roots.
Comments = This sample provides a date for the interface between Strata II and III at the edge of a mound-like area in the northwest portion of Block A.

UGa-2545 (Sample No. 34Pu-105-2):

Half Life 5568 = 1295 ±55 B.P.
Half Life 5730 = 1334 ±55 B.P.
Calendar Date = A.D. 616 ±55 (uncorrected)
Corrected Date = A.D. 660 ±65 (Ralph et. al. 1973)
Corrected Date = A.D. 685 ±75 (Damon et. al. 1974)
Provenience = A58-10; Level 6, 25-30 cm below surface.
Material = 15.5 g of charcoal recovered by waterscreening. The surrounding matrix is a compact silt loam.
Comments = This sample provides a date for Stratum III at the apex of a mound-like area in the northwest portion of Block A.

Two explanations can be provided for the discrepancies between these dates. Sample UGa-2544 may be contaminated by the moderate sized roots found in Level 2. However, this date may be consistent with the other sample because of a difference in elevation between the two squares. Unit A58-10 is approximately 15 cm higher than A44-10. If this is added to the arbitrary level in which Sample UGa-2544 was collected it would date the bottom of Stratum III and top of Stratum IV. If this interpretation is correct then both dates would be acceptable in dating the deposits of this mound-like area.

An earlier radiocarbon determination from a feature in the southern mound-like area dates the feature at A.D. 1100 ±100 (Bobalik 1977: 523). This uncorrected date (UGa-1519) is acceptable in regard to the cultural material associated with the feature and suggests that a late prehistoric component is present at the site.

In summary, three radiocarbon determinations date the deposits at the site. All three are within the accepted range but some problems are associated with sample UGa-2544. In order to fully assess these problems additional radiometric dates will be necessary, and obtaining these will be an important goal during Phase II investigations.

CULTURAL REMAINS

This section describes a minimum of 11,168 artifacts (lithic implements, debitage, ceramics, ground stone, historic debris, and fragmentary faunal and floral remains). The classification system utilizes the class,

group, category, and variety designations discussed in Chapter 6. Artifact categories and varieties used in this report are listed in Table 69. Summary metric data for selected chipped stone and ground stone artifacts are in Tables 70 and 73.

References to existing typological designations have been made whenever possible (especially regarding point categories). The lithic nomenclature used in the descriptions has been adapted from Binford (1963) and White (1963).

Chipped Stone *(01)*

POINTS (01-00)

Large Contracting Stemmed Points *(01-01-01)*

01-01-01A N=19: 5 Complete, 14 Fragmentary (Fig. 60 c-d)

Specimens in this variety are characterized by triangular blade outlines, biconvex cross sections, straight edges (93%), convex (69%) or straight (31%) bases, and contracting stems (94%). The remainder have straight stems. One artifact has a rounded tip, six are acute, and the rest are broken. No cortex is evident. Edge retouch or crushing occurs on 11 specimens. Maximum width is at the shoulders.

Comments: These specimens conform mainly to characteristics of *Gary* points.

References: Bell 1958: 28, Pl. 14; Suhm and Jelks 1962: 197, Pl. 99.

Large Expanding Stemmed/Corner-Notched Points *(01-01-02)*

01-01-02A N=1: 1 Complete (Fig. 60a)

This specimen has shallow corner notches, an expanding stem, a straight base, and biconvex cross section. It has weak shoulders (at which the maximum width is attained) and a triangular blade with straight to excurvate edges which taper to an acute tip. Primary flaking is large and bifacial and secondary retouch is diminuitive. No cortex is present.

Comments: This specimen most closely resembles *Lange* points.

References: Bell 1958: 36, Pl. 18; Suhm and Jelks 1962: 203, Pl. 102.

01-01-02J N=1: 1 Fragmentary (Fig. 60b)

This specimen lacks the tip. It is characterized by one distinct and one weak, rounded shoulder at which the maximum width occurs. The base, stem, and edges are straight. It has a biconvex cross section. Primary flaking is large and bifacial. Retouch occurs along the edges and one edge is slightly serrated. No cortex is present.

Comments: It most closely resembles *Yarbrough* points.

Table 69. Summary of artifact categories and varieties from 34Pu-105.

Chipped Stone *(01)*

POINTS (01-00)
- Large Contracting Stemmed Points *(01-01)*
  - *01-01A*
- Large Expanding Stemmed/Corner-Notched Points *(01-02)*
  - *01-02A*
  - *01-02J*
  - *01-02Q*
  - *01-02V*
- Small Expanding Stemmed/Corner-Notched Points *(01-06)*
  - *01-06A*
  - *01-06B*
  - *01-06C*
  - *01-06D*
  - *01-06I*
- Small Expanding Stemmed/Side-Notched Points *(01-07)*
  - *01-07A*

DRILLS (02-00)
- Shaped Base Drills *(02-01)*
  - *02-01A*

SCRAPERS (05-00)
- Flake/Unifacial Scrapers *(05-02)*
  - *05-02A*

BIFACES (10-00)
- Cobble/Quarried Block Biface I *(10-01)*
  - *10-01A*
- Cobble/Block Biface II/Thick Biface *(10-02)*
  - *10-02A*
- Thin Biface I *(10-03)*
  - *10-03A*
- Thin Biface IIa *(10-04)*
  - *10-04A*
- Thin Biface IIb *(10-05)*
  - *10-05A*
  - *10-05B*

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)
  - *12-01A*

MODIFIED FLAKES (13-00)
  - *13-01A*
  - *13-01B*

Table 69. Continued

SPLIT/TESTED COBBLES (15-00)
Split Cobbles *(15-01)*
15-01A
Tested Cobbles *(15-02)*
15-02A

DEBITAGE (16-00)
16-01A

Fired Clay *(02)*

CERAMICS (01-00)
Plain Grog, Grit, and Bone Tempered Wares *(01-01)*
01-01A
01-01B

BAKED CLAY (03-00)
03-01A

Ground Stone *(03)*

MANOS (01-00)
Unifacial Manos *(01-01)*
01-01A
Bifacial Manos *(01-02)*
01-02A
Pitted Manos *(01-04)*
01-04A

METATES/GRINDING SLABS (02-00)
02-01A

MISCELLANEOUS GROUND STONE IMPLEMENTS (06-00)
Pallets *(06-01)*
06-01A
Ground Stone Fragments *(06-03)*
06-03A

Pecked/Battered/Unmodified Cobbles *(04)*

HAMMERSTONES (01-00)
01-01A

PITTED STONES (02-00)
Unifacial *(02-01)*
02-01A
Bifacial *(02-02)*
02-02A

Table 69. Continued

Historic Debris *(07)*

GLASS (01-00)

01-01A
01-01C
01-01D
01-01E
01-01H

CROCKERY/CERAMICS (02-00)

Ironstone/Porcelain *(02-02)*

02-02B

METAL (03-00)

Nails *(03-01)*

03-01A

Faunal *(08)*

BONE/HORN/TEETH (01-00)

01-01A

Floral *(09)*

References: Bell 1960: 98, Pl. 49; Suhm and Jelks 1962: 261, Pl. 131.

01-01-02Q N=1: 1 Fragmentary

This specimen has a biconvex cross section, broad corner notches, and a straight edge. There is no apparent edge alteration but primary flaking is massive and bifacial. No cortex is present.

Comments: It is similar to the unnamed specimen from 34Lt-32.

References: Bobalik 1977: 418, Fig. 6: g.

01-01-02V N=2: 2 Fragmentary

These specimems have expanding stems, deep corner notches, and slightly barbed shoulders. Lateral edges appear to be straight. Primary flaking is bifacial and small continuous retouch is evident. Neither has evidence of cortex, cross sections are biconvex, and a maximum width occurs at the shoulders.

Small Expanding Stemmed/Corner-Notched Points *(01-01-06)*

01-01-06A N=2: 2 Fragmentary (Fig. 60e)

Both specimens are deeply corner-notched with expanding stems, but one has a straight base and the other is convex. Lateral margins appear to be straight and on one specimen the shoulders (at which maximum width occurs) are slightly barbed. Primary flaking is bifacial and diminuitive. Cross sections are biconvex. Neither specimen has evidence of edge modification or cortex.

Comments: These specimens most closely resemble *Scallorn* points.

References: Bell 1960: 84, Pl. 42; Suhm and Jelks 1962: 285, Pl. 143.

01-01-06B N=1: 1 Fragmentary (Fig. 60f)

The distal and proximal ends are broken. It has a triangular blade outline with straight edges which are slightly serrated. Maximum width occurs at the shoulders. The base may be expanding, and the corner notches appear to be broad. Primary flaking is massive, bifacial, and no secondary retouch is apparent. No cortex is evident.

Comments: This specimen is similar to *Bonham* variety *Talequah* points.

References: Brown 1976: 65, Fig. 17: t-x.

01-01-06C N=1: 1 Complete (Fig. 60 g)

This specimen has a triangular outline, acute tip, narrow corner notches, and a slightly expanding stem which may have been broken and reworked. The base is straight. The shoulders at which the maximum width is obtained are pointed and barbed. Flaking is bifacial and fairly large. Retouch along the lateral edges is discontinuous and diminuitive. Small flake scars are also present on the base. It has a biconvex cross section and no cortex is evident.

Comments: It is similar to *Agee* points.

References: Brown 1976: 73, Fig. 14: a-r.

01-01-06D N=1: 1 Fragmentary (Fig. 60 h)

The tip and one lateral edge are broken. The single lateral edge is straight, the corner notches are broad and shallow resulting in an expanding stem, and the base is slightly convex and has been retouched. It is bifacially flaked and discontinuous retouch occurs along one edge. It has a biconvex cross section. No cortex is present.

Comments: This variety is similar to *Homan* points.

References: Brown 1976: 92-93, Fig. 17: i-n.

01-01-06I N=2: 1 Complete, 1 Fragmentary (Fig. 60 i)

These specimens are corner-notched with convex bases and straight blade edges which are serrated. They have biconvex cross sections. The complete one has an acute tip. The shoulders appear to be slightly barbed and they have expanding stems. Maximum width occurs at the shoulders. The broken specimen has a slight amount of cortex on the dorsal surface.

Comments: These points are similar to *Agee A* points.

References: Brown 1976: 78, Fig. 13: a-j.

Small Expanding Stemmed/Side-Notched Points *(01-01-07)*

01-01-07A N=3: 3 Fragmentary (Fig. 60 j)

These artifacts are distinguished by deeply concave bases with rounded corners and triangular blade outlines with straight to slightly excurvate edges which taper to either an acute or rounded tip. Cross sections are biconvex. These specimens are side-notched and stems are expanding with the maximum width being attained at the shoulders. Primary flaking is bifacial and at least one specimen appears to be retouched. No cortex is present.

<u>Comments</u>: Characteristics of these specimens conform most closely with those of *Morris* points.

<u>References</u>: Bell 1958: 60, Pl. 30; Brown 1976: 93, Fig. 18: a-w.

DRILLS/PERFORATORS (02-00)

Shaped Base Drills *(01-02-01)*

01-02-01A N=1: 1 Fragmentary (Fig. 60 k)

The tip and part of the base of this specimen are broken. It is made from a reworked projectile point, probably a contracting stemmed point *(01-01-01A)*. Maximum width is at the shoulders which taper into a contracting stem. The drill element is broken, but it is situated in the center of the distal end. Flaking is bifacial and small, and diminutive, discontinuous retouch occurs along one edge. It has a biplano cross section and no cortex is present.

SCRAPERS (05-00)

Flake/Unifacial Scrapers *(01-05-02)*

01-05-02A N=6: 6 Complete (Fig. 60 l-m)

These specimens, all made on flakes with striking platforms present, are distinguished by relatively steep distal edge retouch. One specimen is also retouched along a lateral edge. Distal retouch is along three straight and two convex edges. Cortex occurs on three artifacts.

BIFACES (10-00)

Cobble/Quarried Block Biface I *(01-10-01)*

01-10-01A N=8: 6 Complete, 2 Fragmentary (Fig. 60 n)

These specimens have sinuous edges, irregular cross sections, cortex over 50% of their surfaces, and are thick. There is a slight amount of discontinuous battering along the edge of one specimen, but there is no edge alteration on remaining sections. None of these artifacts are shaped.

Cobble/Block Biface II/Thick Biface *(01-10-02)*

01-10-02A N=13: 12 Complete, 1 Fragmentary (Fig. 60 o-p)

These specimens are generally characterized by ovoid to elongated,

Fig. 60 . Selected chipped stone artifacts from the Arrowhead Hill site (34Pu-105).

a: *01-01-02A*

b: *01-01-02J*

c-d: *01-01-01A*

e: *01-01-06A*

f: *01-01-06B*

g: *01-01-06C*

h: *01-01-06D*

i: *01-01-06I*

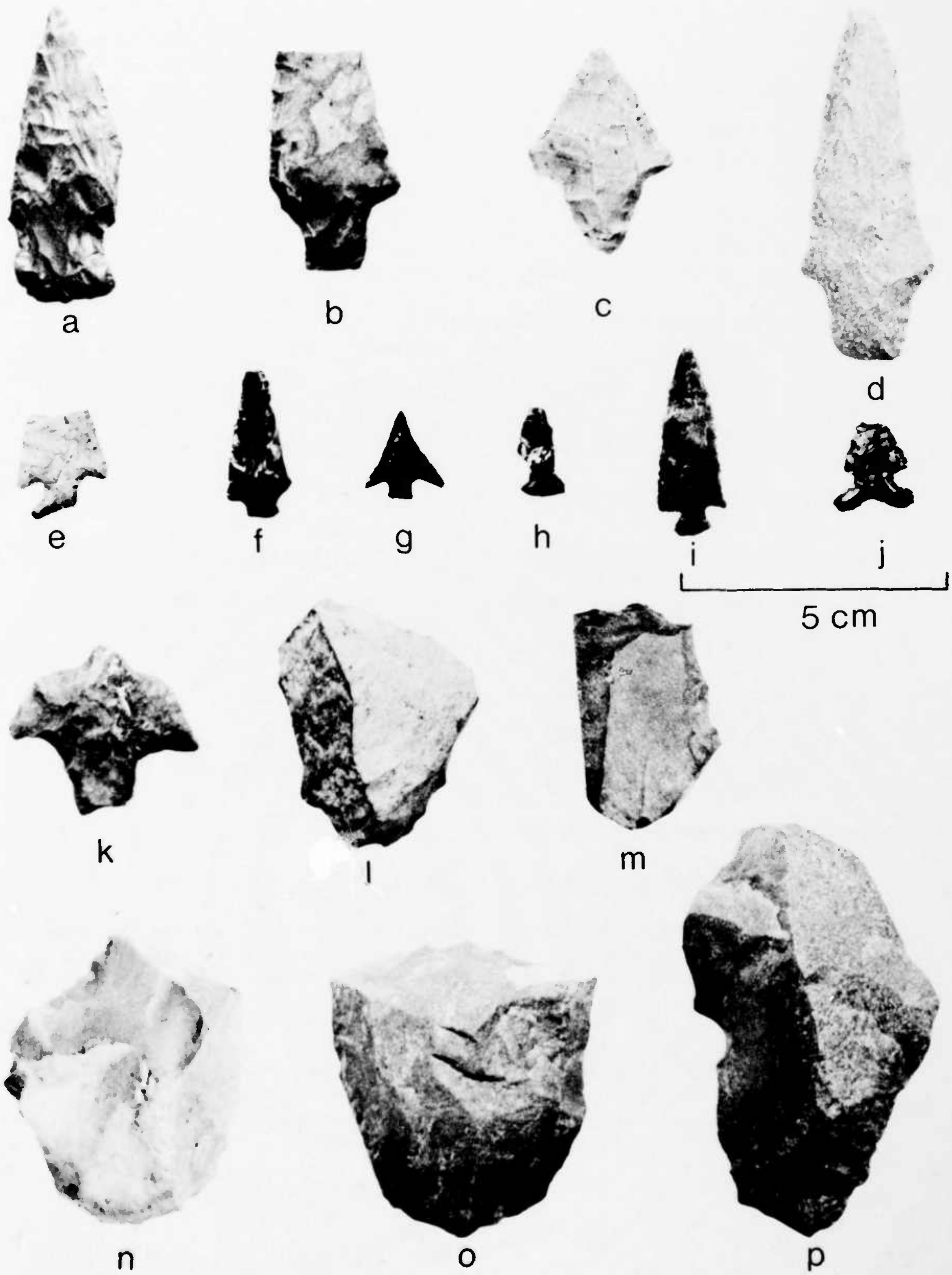
j: *01-01-07A*

k: *01-02-01A*

l-m: *01-05-02A*

n: *01-10-01A*

o-p: *01-10-02A*


a
b
c
d
e
f
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j
5 cm
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n
o
p

rectangular outlines. There is less than 50% cortex present. Some thinning and shaping is evident, and flake scars tend to be large and bifacial. One shaped specimen has a triangular outline with a sharp tip. Another specimen is discontinuously retouched along a single edge. Another biface exhibits crushing and the remainder do not have edge alteration. Cross sections tend to be irregular but two specimens are plano-convex.

Thin Biface I *(01-10-03)*

01-10-03A N=6: 5 Complete, 1 Fragmentary (Fig. 61 a-b)

These specimens are distinguished by an almost total lack of cortex (only one artifact exhibits a small amount of cortex on its dorsal surface). The edges are regular to slightly sinuous. Cross sections are uniform with the majority being irregular, but one is plano-convex. Primary flaking tends to be massive and edge modification in the form of retouch occurs on two artifacts. Shaping ranges from asymmetrically oval to rectangular.

Thin Biface IIa *(01-10-04)*

01-10-04A N=6: 5 Complete, 1 Fragmentary (Fig. 61 c-d)

These artifacts have uniform cross sections, shaping with regular edges, and almost no cortex. Two specimens have minute amounts of cortex on their dorsal surface. Triangular blade outlines predominate but one specimen has excurvate edges. Proximal ends are convex and distal ends are pointed. Primary flaking is still large but smaller than that of the preceeding varieties. Edge alteration in the form of retouch is present on all but one specimen. The retouch varies from continuous to discontinuous and the edge of one artifact is slightly rounded.

Thin Biface IIb *(01-10-05)*

01-10-05A N=5: 2 Complete, 3 Fragmentary (Fig. 61 e-f)

Items in this variety may be classed as preforms and their characteristics indicate potential uses. These specimens exhibit contracting stems and may be an early stage in the manufacture of contracting stemmed points *(01-01-01A)*. None exhibit cortex and one has a striking platform at the proximal end. Cross sections are biconvex. Primary flaking is fairly large and on two specimens secondary retouch is present. One specimen consists of a broken stem while the others have, in addition to the stem, one distinct shoulder. The most complete specimen has a triangular blade outline with straight edges. Maximum width is at the shoulders and all specimens have convex bases.

01-10-05B N=4: 4 Fragmentary (Fig. 61 g-h)

These specimens represent a corner-notched expanding base variety of thin biface IIb. Cross sections are biconvex and cortex is present on one. Bases are convex and the blade outline of the most complete artifact is triangular with straight edges. Primary flaking is fairly large and small amounts of discontinuous retouch is apparent.

POINT/BIFACE FRAGMENTS AND SEGMENTS (12-00)

01-12-01A N=77

These artifacts are too broken to be included in any of the above categories or varieties and are subdivided into distal, proximal, and lateral and medial fragments. Twenty-three distal fragments are represented in the sample. None have cortex and 13 exhibit edge retouch or utilization. Eight have rounded tips and the remainder are acute. Cross sections are biplano to plano-convex. Five specimens are believed to be tip fragments of small corner-notched and side-notched points *(01-01-06* and *01-01-07A)*. At least two of these have serrated edges.

Twenty-eight specimens are basal fragments. Four have small amounts of cortex. Secondary retouch is present on 16 items and two have evidence of crushing along the edges. Base shapes include 10 straight and 18 convex. One specimen may be a fragment of a large contracting stemmed point *(01-01-01A)* and another may be part of an expanding stemmed/corner-notched point *(01-01-02)*.

Twenty-six lateral and medial segments are present. One has evidence of cortex and 16 exhibit secondary retouch. One of these is distinguished by serrated edges.

MODIFIED FLAKES (13-00)

01-13-01A N=6: 6 Complete (Fig. 61 i-k)

These items are distinguished by having sharp, bifacially retouched projections along one edge. Two specimens have projections along a lateral edge resulting in a beak-like appearance, one has a small projection or "spur" in the central portion of the left lateral edge, and the remainder have distal projections. Striking platforms are present on all specimens, and five have cortex on the dorsal side.

01-13-01B N=112: 45 Complete, 67 Fragmentary

These flakes exhibit signs of wear consisting of numerous small and

Table 70. Metric attributes for selected chipped stone varieties from 34Pu-105.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-01A					
$\bar{x}$	42.8	28.4	7.1	12.5	14.8
s.d.	3.6	3.5	1.3	2.0	1.8
range	30.6-50.3	23.6-34.7	5.1-9.1	8.4-16.4	12.8-18.8
N	7	16	19	15	13
01-01-02A					
$\bar{x}$	55.7	20.8	7.1	12.4	19.3
N	1	1	1	1	1
01-01-02J					
$\bar{x}$	-	24.2	7.2	10.2	12.5
N	-	1	1	1	1
01-01-02Q					
$\bar{x}$	-	31.1	-	14.9	22.0
N	-	1	-	1	1
01-01-02V					
$\bar{x}$	-	26.7	7.2	9.2	14.1
s.d.	-	-	-	1.0	3.0
range	-	-	-	8.2-10.2	11.1-17.0
N	-	1	1	2	2
01-01-06A					
$\bar{x}$	-	13.3	3.9	4.7	9.3
s.d.	-	3.5	0.2	1.2	-
range	-	9.8-16.8	3.7-4.1	3.5-5.9	-
N	-	2	2	2	1
01-01-06B					
$\bar{x}$	-	12.7	5.0	-	5.9
N	-	1	1	-	1
01-01-06C					
$\bar{x}$	16.0	14.5	3.0	2.8	4.0
N	1	1	1	1	1

Table 70. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-01-06D					
$\bar{x}$	-	-	-	6.3	-
N	-	-	-	1	-
01-01-06I					
$\bar{x}$	34.6	12.4	3.2	4.7	5.2
s.d.	-	0.5	0.2	0.1	0.3
range	-	11.9-12.8	3.0-3.4	4.6-4.8	4.9-5.4
N	1	2	2	2	2
01-01-07A					
$\bar{x}$	-	13.2	2.9	5.0	6.3
s.d.	-	1.6	0.4	0.3	1.1
range	-	11.0-14.7	2.3-3.3	4.7-5.2	4.8-7.3
N	-	3	3	2	3
01-02-01A					
$\bar{x}$	-	35.0	6.7	8.9	13.3
N	-	1	1	1	1
01-05-01A					
$\bar{x}$	34.0	29.2	9.6	-	-
s.d.	8.4	8.1	3.3	-	-
range	21.1-43.9	17.3-39.9	5.0-13.7	-	-
N	6	6	6	-	-
01-10-01A					
$\bar{x}$	61.1	45.0	31.6	-	-
s.d.	14.1	8.5	8.8	-	-
range	43.5-83.1	33.7-58.8	20.6-47.7	-	-
N	6	6	6	-	-
01-10-02A					
$\bar{x}$	59.2	41.7	22.0	-	-
s.d.	18.1	4.5	4.6	-	-
range	37.6-91.8	35.2-49.0	14.1-30.1	-	-
N	12	12	12	-	-

Table 70. Continued

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS	STEM LENGTH	STEM WIDTH
01-10-03A					
$\bar{x}$	51.5	40.3	16.8	-	-
s.d.	8.5	10.0	4.0	-	-
range	41.2-63.7	29.8-58.3	11.3-22.8	-	-
N	5	5	5	-	-
01-10-04A					
$\bar{x}$	55.8	29.8	11.9	-	-
s.d.	15.2	8.4	5.4	-	-
range	35.8-79.2	15.7-40.0	6.0-18.5	-	-
N	5	6	6	-	-
01-10-05A					
$\bar{x}$	53.5	29.9	9.0	-	-
s.d.	1.2	6.8	1.1	-	-
range	52.3-54.6	19.5-36.0	8.3-11.0	-	-
N	2	4	4	-	-
01-10-05B					
$\bar{x}$	65.7	25.3	6.0	-	-
s.d.	-	10.1	1.7	-	-
range	-	11.9-36.2	5.0-7.8	-	-
N	1	3	3	-	-
01-13-01A					
$\bar{x}$	32.2	21.6	8.4	-	-
s.d.	7.6	1.6	2.8	-	-
range	20.8-45.6	18.9-24.0	5.7-12.4	-	-
N	6	6	6	-	-
01-15-01A					
$\bar{x}$	36.9	27.1	15.0	-	-
N	1	1	1	-	-
01-15-01B					
$\bar{x}$	74.3	52.4	38.5	-	-
s.d.	9.3	15.8	12.1	-	-
range	61.6-89.4	37.0-73.0	23.2-62.5	-	-
N	6	6	6	-	-

irregular flake scars. Edge alteration occurs predominantly along lateral edges but distal and proximal modification are also present. Table 71 presents summary statistics of this variety according to material type.

SPLIT/TESTED COBBLES (15-00)

Split Cobbles *(01-15-01)*

01-15-01A N=1: 1 Complete (Fig. 61 1)

The majority of the dorsal surface of this specimen is covered with cortex. It has been fragmented toward the distal end by the removal of large flakes. The ventral surface is flat and even and no flakes have been removed. The specimen has rounded edges suggesting a water worn cobble and was presumably split to check the quality of chert.

Tested Cobbles *(01-15-02)*

01-15-02A N=6: 6 Complete (Fig. 62 a-c)

These specimens are characterized by the removal of only a few flakes and the remainder of the cobble retains its original shape and cortex. In all cases, the roundness of the outer surface suggests that these cobbles were water rolled. It is assumed that the removal of large flakes was undertaken to test the quality of chert. One specimen is differentiated by discontinuous retouch scars occurring along the edge from which primary flakes had been removed.

DEBITAGE (16-00)

01-16-01A N=10,845

This variety consists of flakes and pieces of blocky debris which do not exhibit evidence of use or wear. Raw material types are presented in Table 72. Data regarding the waterscreen square (A58-10) are not included. Approximately 3071 flakes have some cortex, and of these 649 retain striking platforms. Flakes with no cortex are the most common and 1473 of this group retain striking platforms.

Fired Clay *(02)*

Only four small fragmentary pieces of pottery and four pieces of burned clay were recovered during Phase I investigations.

Table 71. Summary statistics of modified flakes (01-13-01B) at 34Pu-105[1].

	Type A		Type B		Type D		Type F		Type G		Type H		Type J		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Total modified flakes	53	47	22	20	19	17	5	4	1	1	2	2	10	9	112
Modified flakes with dorsal cortex	17	41	7	17	10	24	2	5	-	-	1	2	4	10	41
Modified flakes with striking platforms	19	41	8	17	9	20	4	9	-	-	1	2	5	11	46
Utilized and retouched edges															
Edge Shape:															
Straight	40	53	14	18	11	14	3	4	-	-	2	3	6	8	76
Concave	7	39	4	22	5	27	-	-	-	-	-	-	2	11	18
Convex	3	27	3	27	3	27	1	9	1	9	-	-	-	-	11
Concave-convex	1	100	-	-	-	-	-	-	-	-	-	-	-	-	1
Undetermined	2	40	1	20	-	-	1	20	-	-	-	-	1	20	5
Placement of modification:															
Lateral	35	42	18	21	16	19	3	4	1	1	2	2	9	11	84
Distal	4	44	2	22	1	11	1	11	-	-	-	-	1	11	9
Proximal	1	100	-	-	-	-	-	-	-	-	-	-	-	-	1
Undetermined	13	72	2	11	2	11	1	6	-	-	-	-	-	-	18
Location of modification:															
Dorsal	47	48	21	21	16	16	3	3	1	1	2	2	8	8	98
Ventral	6	43	1	7	3	21	2	15	-	-	-	-	2	15	14

[1] Table format adapted from Chapman (1977: 395-400).

Table 72. Horizontal and vertical distribution of lithic debitage (01-16-01A) by material type at 34Pu-105.

Provenience (Square:Level)	Lithic Type											Total	%
	A	B	C	D	E	F	G	H	I	J	K		
A1-14													
1 (0-10 cm)	25	4	-	2	-	-	1	3	-	2	-	37	.3
2 (10-20 cm)	33	4	-	1	-	-	4	2	-	3	-	47	.4
3 (20-30 cm)	38	8	-	-	-	-	1	2	-	-	-	49	.5
*4 (30-40 cm)	6	-	-	4	-	-	-	-	-	-	-	10	.1
A20-22													
1 (0-10 cm)	188	23	-	2	-	3	12	7	-	5	-	240	2.2
2 (10-20 cm)	77	14	1	-	-	-	3	2	-	3	-	100	.9
3 (20-30 cm)	45	7	-	-	-	-	-	1	-	1	-	54	.5
4 (30-40 cm)	3	4	-	-	-	-	2	2	-	-	-	11	.1
A20-23													
1 (0-10 cm)	143	35	-	4	-	1	5	13	-	13	-	214	2.0
2 (10-20 cm)	69	18	-	1	-	-	4	2	-	3	-	97	.9
A29-3													
1 (0-10 cm)	303	28	2	4	-	-	9	18	-	4	-	368	3.4
2 (10-20 cm)	113	16	-	-	-	3	1	2	-	-	-	135	1.3
3 (20-30 cm)	88	10	-	-	-	-	-	2	-	-	-	100	.9
4 (30-40 cm)	28	3	-	-	-	-	1	2	-	-	-	34	.3
A34-8													
1 (0-10 cm)	49	9	1	-	-	-	3	-	-	3	-	65	.6
2 (10-20 cm)	27	14	1	1	-	-	-	5	-	3	-	51	.5
3 (20-30 cm)	10	3	-	-	-	-	-	-	-	-	-	13	.1
A38-17													
1 (0-10 cm)	467	41	-	-	-	-	5	10	-	17	-	540	5.0
2 (10-20 cm)	471	26	2	-	-	1	2	18	-	20	-	540	5.0
3 (20-30 cm)	224	30	-	3	-	-	3	7	-	13	-	280	2.6
4 (30-40 cm)	47	12	-	-	-	-	1	5	-	1	-	66	.6
A44-10													
1 (0-10 cm)	214	20	-	-	1	-	11	4	-	13	-	263	2.3
2 (10-20 cm)	237	36	-	1	-	-	4	9	-	3	-	290	2.7
3 (20-30 cm)	188	12	-	-	-	-	3	11	-	2	-	216	2.0
4 (30-40 cm)	27	4	1	-	-	-	-	2	-	1	-	35	.3
5 (40-50 cm)	-	2	-	-	-	-	1	-	-	-	-	3	<.1
A46-15													
1 (0-10 cm)	52	9	-	-	-	1	3	2	-	2	-	69	.6
2 (10-20 cm)	60	8	-	1	-	-	1	3	-	2	-	75	.7
3 (20-30 cm)	32	4	-	-	-	-	1	2	-	-	-	39	.4
4 (30-40 cm)	1	-	-	-	-	-	-	-	-	1	-	2	<.1
A48-18													
1 (0-10 cm)	63	7	-	2	-	-	4	-	-	4	-	80	.7
2 (10-20 cm)	53	11	-	-	-	1	-	1	-	-	-	66	.6
3 (20-30 cm)	14	2	-	1	-	-	-	1	-	-	-	18	.2
4 (30-40 cm)	7	2	-	-	-	-	-	1	-	1	-	11	.1

Table 72. Continued

Provenience (Square:Level)	A	8	C	0	E	F	G	H	I	J	K	Total	%
A55-12													
1 (0-10 cm)	284	52	2	-	-	-	16	9	-	10	-	373	3.4
2 (10-20 cm)	505	89	4	8	-	-	37	36	-	36	-	715	6.6
3 (20-30 cm)	416	68	-	2	-	2	20	34	-	27	-	569	5.2
4 (30-40 cm)	172	30	-	3	-	6	6	10	-	6	-	233	2.2
5 (40-50 cm)	88	35	-	-	-	-	6	8	-	8	-	145	1.3
6 (50-60 cm)	38	9	-	-	-	-	2	5	-	4	-	58	.5
*7 (60-70 cm)	1	-	-	-	-	-	-	-	-	-	-	1	<.1
A58-20													
1 (0-10 cm)	270	56	-	1	2	-	11	8	-	17	-	365	3.4
2 (10-20 cm)	334	35	-	6	-	-	22	12	-	18	-	427	3.9
3 (20-30 cm)	339	36	-	3	-	-	18	10	-	26	-	432	4.0
4 (30-40 cm)	275	32	-	-	-	1	15	21	-	8	-	352	3.3
5 (40-50 cm)	237	37	-	-	-	1	8	6	-	9	-	298	2.8
6 (50-60 cm)	203	38	-	-	-	-	17	8	-	12	-	278	2.7
7 (60-70 cm)	26	6	-	-	-	-	-	2	-	-	-	34	.3
*8 (70-80 cm)	2	1	-	-	-	-	-	-	-	-	-	3	<.1
A60-5													
1 (0-10 cm)	476	36	2	5	-	-	10	19	-	23	-	571	5.3
2 (10-20 cm)	371	31	-	-	-	-	10	11	-	17	-	440	4.1
3 (20-30 cm)	315	37	-	-	-	-	-	11	-	8	-	371	3.4
4 (30-40 cm)	58	6	-	2	-	-	-	4	-	3	-	73	.7
5 (40-50 cm)	2	2	-	-	-	-	-	-	-	-	-	4	<.1
A63-17													
1 (0-10 cm)	53	7	-	-	-	-	6	6	-	3	-	75	.7
2 (10-20 cm)	38	6	-	-	-	-	-	1	-	-	-	45	.4
3 (20-30 cm)	6	1	-	-	-	-	-	-	-	-	-	7	<.1
850-7													
1 (0-10 cm)	158	35	-	-	-	2	12	8	-	10	-	225	2.1
2 (10-20 cm)	108	21	-	3	-	1	13	5	-	12	-	163	1.5
3 (20-30 cm)	128	24	-	1	-	-	5	7	-	6	-	171	1.6
4 (30-40 cm)	96	21	-	4	-	-	9	2	-	11	-	143	1.3
5 (40-50 cm)	21	12	-	1	-	-	3	4	-	3	-	44	.4
6 (50-60 cm)	8	-	1	2	1	-	-	-	-	-	-	12	.1
Total	8430	1189	17	68	4	23	331	386	-	397	-	10,845	100.0
%	78.0	10.0	.2	.6	-	.2	3.0	4.0	-	4.0			100.0

*Indicates only one-half of square excavated.

CERAMICS (01-00)

Plain Grog, Grit, and Bone Tempered Wares *(02-01-01)*

02-01-01A N=3: 3 Body sherds

These sherds are smoothed, have coarse textures, and are primarily grog tempered. Grog inclusions range up to 1.5 mm in size. Relatively small amounts of grit and bone also occur. Two sherds have an average thickness of 9.8 mm. They have brown exterior colors and very dark gray interior colors. The third sherd is 7.1 mm thick and has a light yellowish brown exterior and interior color.

Comments: This variety corresponds closely to *Williams Plain* pottery.

References: Brown 1971: 42-48.

02-01-01B N=1: 1 Body sherd

This specimen is characterized by a very dark color, predominantly grit tempering with some bone and grog inclusions, and a relatively uneven, burnished exterior surface. It is 7.0 mm thick, and the texture of the paste is moderate.

Comments: This specimen conforms to the definition of *LeFlore Plain* pottery in eastern Oklahoma, and is consistent with the description of similar pottery from the Wister Valley.

References: Brown 1971: 58-61; Galm 1978a: 174-175.

BAKED CLAY (03-00)

02-03-01A N=4

This variety consists of small amorphous fragments of burned or fired clay which are not impressed. Colors vary from light yellowish brown to yellow.

Ground Stone *(03)*

Table 73 presents a summary of measurements for artifacts in this class.

Fig. 61 . Selected chipped stone artifacts from the Arrowhead Hill site (34Pu-105).

a-b: *01-10-03A*

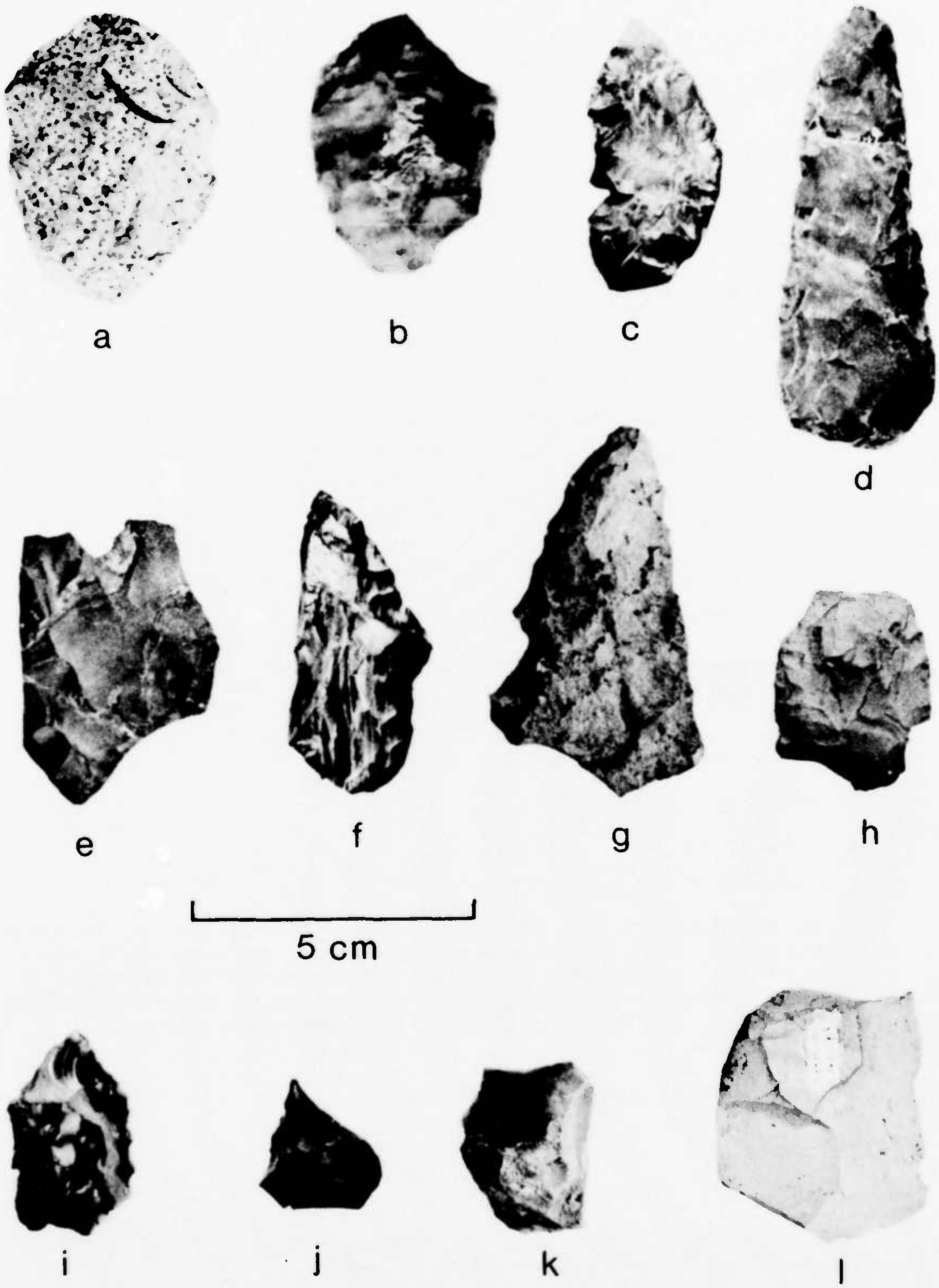
c-d: *01-10-04A*

e-f: *01-10-05A*

g-h: *01-10-05B*

i-k: *01-13-01A*

l: *01-15-01A*


a
b
c
d
e
f
g
h
5 cm
i
j
k
l

MANOS (01-00)

Unifacial Manos *(03-01-01)*

03-01-01A N=1: 1 Fragmentary

This specimen has been laterally broken but it probably had an elongated oval outline. One face has been ground smooth and there is evidence of grinding along the edges. The other side is unaltered.

Bifacial Manos *(03-01-02)*

03-01-02A N=3: 1 Complete, 2 Fragmentary (Fig. 62 d)

Specimens in this variety are characterized by grinding or smoothing on both surfaces. In addition, some battering occurs along the edges of two artifacts. The complete specimen has an elongated oval shape.

Pitted Manos *(03-01-04)*

03-01-04A N=3: 2 Complete, 1 Fragmentary

The ventral surface of one complete artifact has been ground smooth and probably was used for grinding. However, a U-shaped concavity (6.9 mm deep) has been pecked into the otherwise unaltered dorsal surface. The edges of this specimen show no evidence of use. The other complete and the broken specimen also have smoothing on the ventral surface and small depressions (about 2.1 mm deep) on the dorsal surface. The complete specimens have an elongated oval outline.

METATE/GRINDING SLAB (02-00)

Slab *(03-02-01)*

03-02-01A N=3: 3 Complete

Two specimens are made from angular pieces of sandstone and the third is semicircular. One side has been smoothed on two specimens while the other is bifacially smoothed. A slightly concave depression is present on one angular fragment. One edge on two artifacts appears to be smoothed and slightly rounded but the edges of the third fragment are unaltered.

MISCELLANEOUS GROUND STONE IMPLEMENTS (06-00)

Pallets *(03-06-01)*

03-06-01A N=1: 1 Complete

This specimen has been slightly pecked and smoothed on both sides. Small amounts of battering appear along one edge.

Ground Stone Fragments *(03-06-03)*

03-06-03A N=3 (Fig. 62 e)

These are too fragmentary or the alteration is too small to allow their placement into any of the above varieties. At least one side and one edge have been smoothed on each specimen.

Pecked/Battered/Unmodified Cobbles *(04)*

A summary of measurements for these artifacts is provided in Table 73.

HAMMERSTONES (01-00)

04-01-01A N=1: 1 Complete (Fig. 62 f)

This elongated artifact is made from sandstone. One end is slightly pecked and battered. Some smoothing occurs on the dorsal surface.

PITTED STONES (02-00)

Unifacial *(04-02-01)*

04-02-01A N=1: 1 Fragmentary

This specimen is unaltered except for a shallow pecked depression (4.8 mm deep) on one side and a small amount of grinding along one edge.

Bifacial *(04-02-02)*

04-02-02A N=2: 2 Complete (Fig. 62 g)

One edge of these sandstone artifacts has been smoothed or battered. On one specimen the dorsal and ventral surfaces have been smoothed but slightly pecked U-shaped depressions (average depth is 2.5 mm) are also present. The other specimen is unaltered except for small concavities on both sides (depths range between 2.5 mm and 4.6 mm).

Historic Debris *(07)*

Thirteen specimens indicate the presence of a late historic component at the site. For purposes of description they are divided into three categories.

Table 73. Metric attributes for ground stone and battered/pecked stone varieties from 34Pu-105.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS
03-01-01A			
$\bar{x}$	-	74.6	35.9
N	1	1	1
03-01-02A			
$\bar{x}$	99.1	80.5	42.1
s.d.	8.3	-	4.4
range	90.8-107.4	-	36.6-47.3
N	2	1	3
03-01-04A			
$\bar{x}$	124.4	97.4	45.8
s.d.	35.8	14.8	13.1
range	88.6-160.2	82.6-112.1	31.1-63.0
N	2	2	3
03-02-01A			
$\bar{x}$	175.0	109.3	56.9
s.d.	-	-	8.8
range	-	-	50.0-69.3
N	1	1	3
03-06-01A			
$\bar{x}$	147.1	86.7	52.7
N	1	1	1
03-06-03A			
$\bar{x}$	92.0	81.2	29.9
s.d.	41.7	42.6	7.1
range	59.0-150.8	41.1-140.1	24.6-39.9
N	3	3	3
04-01-01A			
$\bar{x}$	85.8	63.6	39.4
N	1	1	1

Table 73. Continued.

ARTIFACT VARIETY	LENGTH	WIDTH	THICKNESS
04-02-01A			
$\bar{x}$	70.8	42.0	49.4
N	1	1	1
04-02-02A			
$\bar{x}$	102.4	71.8	58.5
s.d.	7.7	8.0	3.6
range	94.7-110.1	63.8-79.7	54.9-62.1
N	2	2	2

Fig. 62. Selected chipped, ground, and pecked/battered stone artifacts from the Arrowhead Hill site (34Pu-105).

a-c: *01-15-02A*

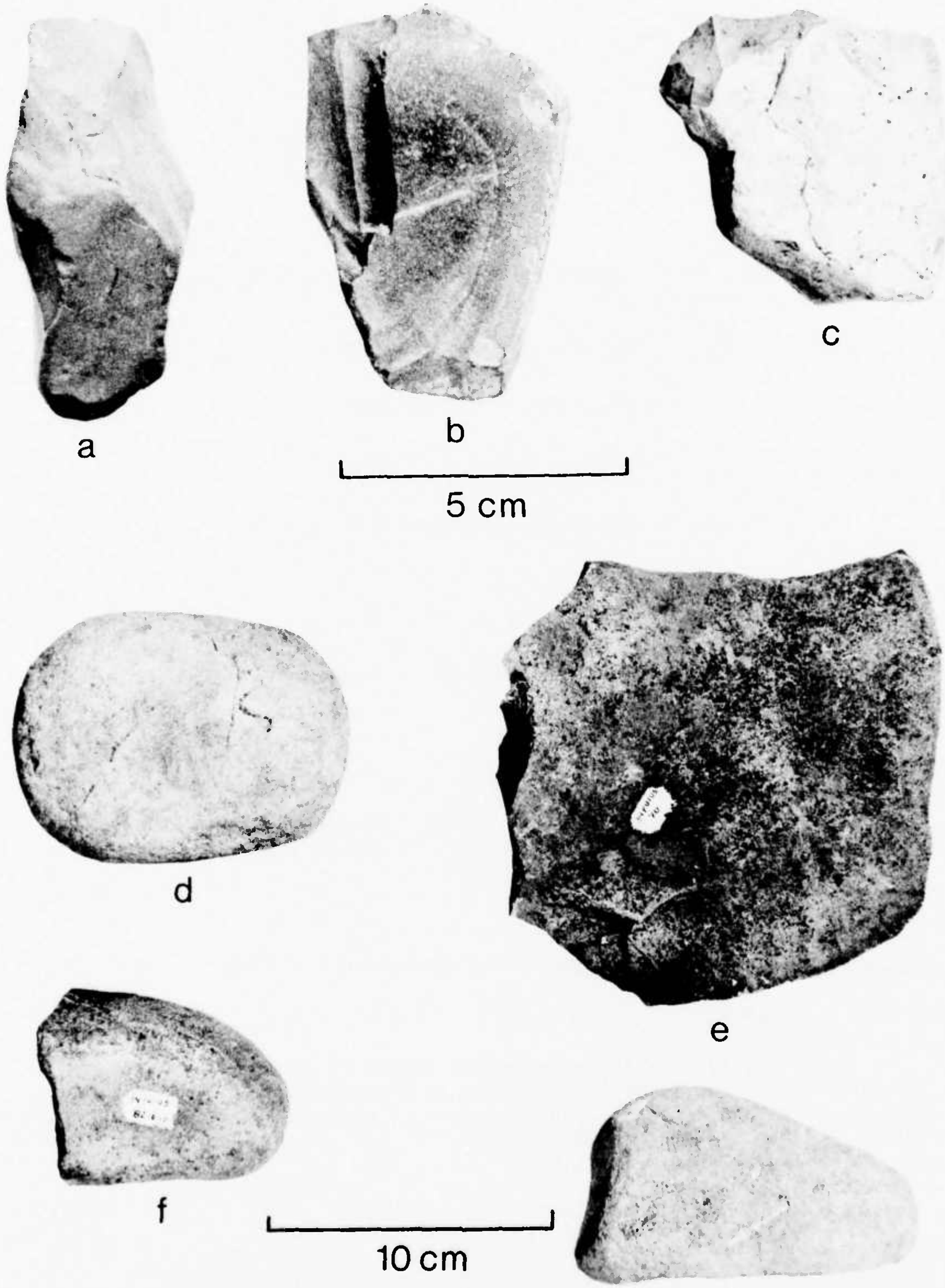
d: *03-01-02A*

e: *03-06-03A*

f: *04-01-01A*

g: *04-02-02A*

Note: Artifacts d-g are shown at 10 cm scale.


a
b
c
5 cm
d
e
f
10 cm
g

GLASS (01-00)

07-01-01A N=1

This is a small amorphous fragment of clear glass.

07-01-01C N=5

These are small, amorphous fragments of "purpled" glass. They are translucent and may be bottle fragments.

Comments: "Purpled" glass may suggest a pre-1917 historic occupation.

References: C. Wallis, personal communication.

07-01-01D N=1

This is small, amorphous amber-colored fragment of glass. It is translucent.

07-01-01E N=1

This is a small fragment of opaque, milk-white glass which may be a jar fragment.

07-01-01H N=1

This is a small, translucent fragment of green glass which has an indistinguishable design or mark on it. It may be a bottle fragment.

CROCKERY/CERAMICS (02-00)

Ironstone/Porcelain *(07-02-02)*

07-02-02B N=2

These are plain whiteware ceramic fragments with glazed exteriors and interiors. One is probably a base as a potter's mark is visible. The mark is green and consists of an indistinguishable letter above a horizontal line. Beneath the line are the letters "W. VA". The thickness of these specimens ranges from 3.4-4.5 mm.

METAL (03-00)

Nails *(07-03-01)*

07-03-01A N=2

These specimens are round, heavily corroded, and the tips are bent at right angles suggesting that they have been pried from lumber. They range in length from 42.4-57.5 mm.

Faunal *(08)*

BONE/HORN/TEETH (01-00)

08-01-01A

Preservation of faunal remains was extremely poor and no identifiable materials were recovered. Small fragments, less than 2.0 g in weight make up this variety.

Floral *(09)*

Preservation of these materials was also poor and consisted of charred and uncharred nut fragments, seeds, and charcoal.

DISCUSSION AND INTERPRETATIONS

Based on limited excavations in 1976 and 1978 a number of research goals will be addressed. However, it should be emphasized that the 1978 excavation program does not fulfill mitigation requirements and most of the goals cannot be adequately assessed at the present time. As a result, the site has been recommended for additional excavation during Phase II.

Horizontal Distributions

The 1978 excavations concentrated on a mound-like area at the northwest end of Block A (Fig.57), although additional squares were excavated to the east and south within the 40 m^2 block. With the exception of one randomly selected square and one additional unit (B50-7), no other excavations were conducted in the south mound-like area. A feature was recovered in this area during the 1976 investigation (Bobalik 1977: 519). Table 74 presents the horizontal distribution of cultural material and concentration indices (total number of artifacts per level divided by

Table 74. Horizontal distribution of artifacts by excavation units at 34Pu-105.

Artifact Variety	A1-14*	A20-22	A20-23	A29-3*	A34-8*	A38-17*	A44-10*	A46-15*	A48-18*	A55-12*	A58-10[1]	A58-20*	A60-5*	A63-17*	850-7	Surface	Total
01-01-01A	1		1			2	4		1	3	2	2	1	1	1		19
01-01-02A										1							1
01-01-02J													1				1
01-01-02Q										1							1
01-01-02V												1			1		2
01-01-06A							1								1		2
01-01-068				1													1
01-01-06C											1						1
01-01-060												1					1
01-01-06I						1									1		2
01-01-07A									1					2			3
01-02-01A												1					1
01-05-02A			1			1					4						6
01-10-01A			1	1		1	2				1	1	1				8
01-10-02A	1	2				1				1	5	1			2		13
01-10-03A			1			1			1	1	1	1					6
01-10-04A						1					1	2	1		1		6
01-10-05A											1	1	1		1	1	5
01-10-058											1	1			1		3
01-12-01A	2	4	3	2	1	3	8		1	17	9	9	13	1	4		77
01-13-01A		1			1		1				2	1					6
01-13-018	2	2	1	3	3	4	12	2		16	28	11	20	1	7		112
01-15-01A			1														1
01-15-02A		1				1					1	2		1			6
01-16-01A	143	405	311	637	129	1426	807	185	175	2094		2189	1459	127	758		10,845
02-01-01A		1							2								3
02-01-018		1															1
02-03-01A										2		2					4

Table 74. Continued.

Artifact Variety	A1-14*	A20-22	A20-23	A29-3*	A34-8*	A38-17*	A44-10*	A46-15*	A48-18*	A55-12*	A58-10[1]	A58-20*	A60-5*	A63-17*	B50-7	Surface	Total
03-01-01A							1										1
03-01-02A								1			1					1	3
03-01-04A											1	1				1	3
03-02-01A																3	3
03-06-01A										1							1
03-06-03A		1							1	1							3
04-01-01A											1						1
04-02-01A													1				1
04-02-02A													1			1	2
07-01-01A		1															1
07-01-01C	2	2	1														5
07-01-01D		1															1
07-01-01E	1																1
07-01-01H				1													1
07-02-028		1	1														2
07-03-01A			1			1											2
08-01-01A	-	-	-	-	-	+	-	-	-	+	+	+	-	-	+	-	-
09	-	+	+	-	-	+	+	-	+	-	+	+	+	+	+	-	-
Total	152	423	323	645	134	1443	836	188	182	2138	60	2227	1499	133	778	7	11,168
Number of Excavated Levels	3.5	4	2	4	3	4	5	4	4	6.5	6	7.5	5	3	5.5		
Concentration Index	43	106	162	161	45	361	167	47	46	329		297	300	44	141		

*Denotes randomly selected squares.

[1] Concentration Index not calculated.

the number of excavated levels by square). No material was recovered in A8-18 and there appears to be a substantial decrease of cultural material in the units east of A46-15.

In order to test the significance of areas west and east of A46-15, a t-test was performed using data from only the randomly selected squares (Barr et. al. 1976). However, since no material came from A8-18 it was omitted from the analysis. The null hypothesis states that there are no significant differences between A58-20, 55-12, 60-5, 44-10, and 38-17 and A63-17, 46-15, 48-18, 34-8, 29-3, and 1-14. A .05 level of probability was set to reject the null hypothesis. The results indicate that the null hypothesis should be rejected at a probability level of .0001.

One explanation for this difference may be due to vertical and horizontal displacement of artifacts through plowing and/or erosion. It appears that squares west of A46-15 were never cultivated since this is a tree covered mound (Fig. 63). However, areas east, north, and partially south are relatively flat (A1-14 is at the northern terminus of another mound) and could have been modified through erosion or agricultural activities. Table 77 presents the distribution of unmodified flakes by excavation squares according to area of concentration. It can be observed that in all but two squares on the tree covered knoll area more flakes occur in the second arbitrary level than the first. This includes A46-15 which is off the mound, but at the eastern edge of the tree line. On the other hand, units outside the tree line tend to have an unimodal distribution of unmodified flakes. This indicates that plowing or erosion may have adversely affected the upper levels of these squares. However, if this is true then we should expect this trend to occur in all previously cultivated areas. But in A20-22 through 29-3 and B50-7 there is a large increase in the number of flakes in Levels 1 and 2. Interestingly, these units are associated with or in close proximity to cultural features, and this could explain the increase in flake counts. As a result we cannot argue strongly for an agricultural or erosional cause for the decrease in the number of flakes and tool fragments in squares east of A46-15.

Another possibility, and probably the most economical, is that the decrease in the amount of flakes in squares east of A46-15 and the lack of material in A8-18 relates to their position. These excavation units are close to the edge of the site.

Data recovered by Bobalik (1977) indicate a similar horizontal distribution. There is a substantial increase in cultural material within the southern mound-like area. This area contains a feature as well as squares A1-14 and B50-7.

It appears that at least three horizontal concentrations of material remains are present at the site. One is the mound-like area at the north end of Block A, the second is the area surrounding A20-22, 20-23, and 29-3, and the third is another mound-like area at the southeast and northeast ends of Blocks A and B, respectively (Fig. 63). These may reflect

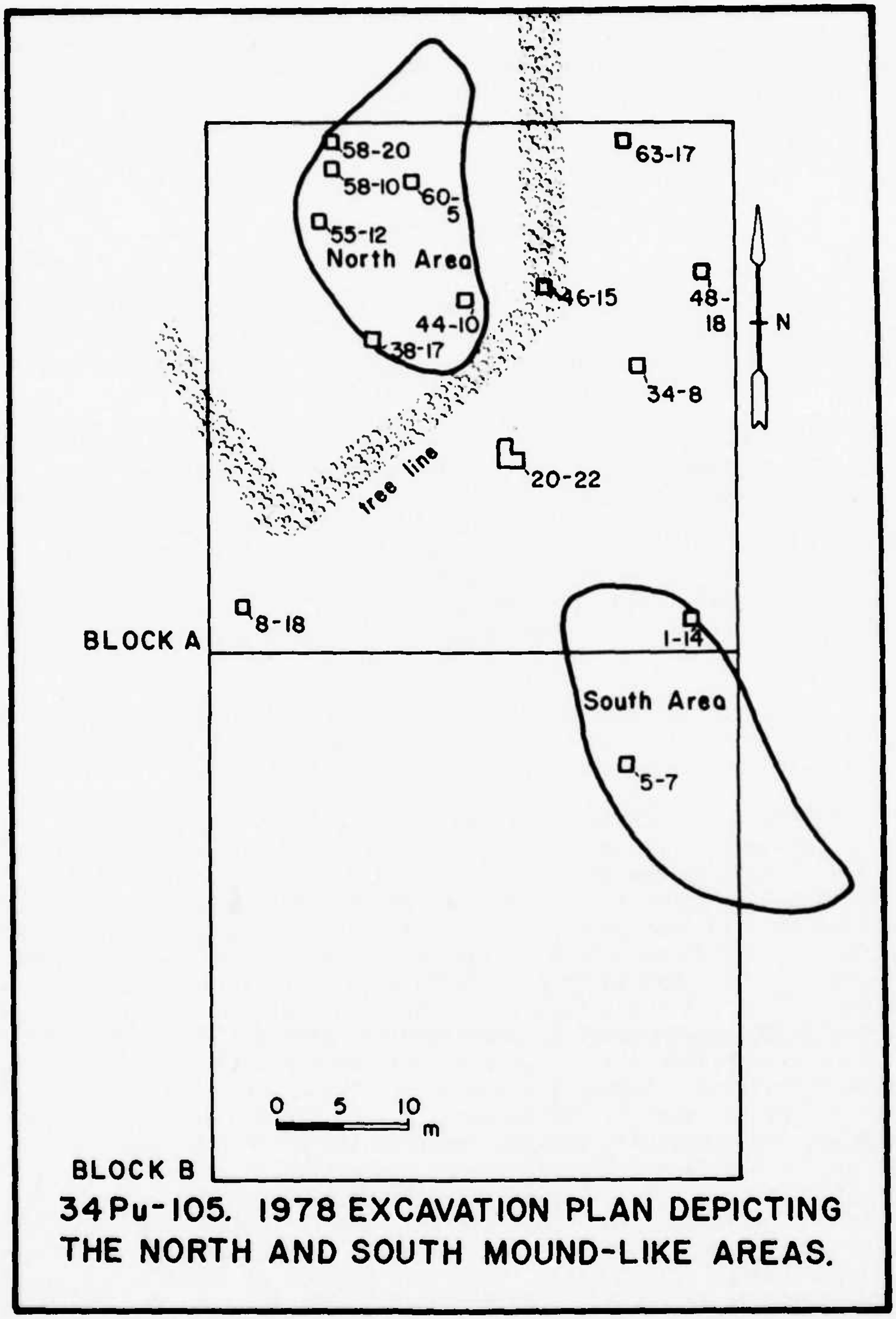


Fig. 63. 1978 excavation plan of the Arrowhead Hill site (34Pu-105) depicting the north and south mound-like areas.

either temporally discrete occupations or activity areas. At the present time, the north and south mound-like areas appear to be chronologically distinct, but their association with the intervening area is unknown. This question will be addressed more fully during Phase II investigations at the site.

Vertical Distributions

Table 75 presents distributional data for each artifact variety at the site by arbitrary level. Specimens recovered from the control square, A58-10, which was excavated in 5 cm levels are also presented, but the levels have been combined into 10 cm units for comparability.

There appears to be some vertical separation of materials especially in the point categories. This is not reflected in the distribution of large contracting stemmed points *(01-01-01A)* which are predominant in Level 1 (42%), but occur through Level 5. Expanding stemmed/corner-notched points *(01-01-02)*, on the other hand, are concentrated in small numbers in Levels 4 and 5, even though one specimen *(01-01-02J)* occurs in Level 2. Small point categories *(01-01-06* and *01-01-07)* most commonly occur (80%) in Levels 1-2 even though single specimens are present in Levels 3-4.

The single drill/perforator *(01-02-01A)* made from a reworked contracting stemmed point is from Level 4 but 80% of the unifacial scrapers *(01-05-02A)* are from Level 1 while 10% occur in Levels 3 and 4, respectively.

Artifacts associated with the lithic reduction sequence include biface categories *(01-10-01* through *01-10-06)*, split/tested cobbles *(01-15-01)*, as well as the point categories *(01-01-00)*. Bobalik (1977: 31-44) identifies five activity sets associated with this sequence. The initial activity sets include procurement and initial modification which are reflected by split/tested cobbles *(01-15-01)* and cobble/quarried block biface I's *(01-10-01A)*. Artifacts associated with these activity sets are most common in Levels 1 and 2 (40% each) but one specimen (7%) is in Level 3 and two (13%) are in Level 5. Cobble/block biface II/thick bifaces *(01-10-02A)* and thin biface I's *(01-10-03A)* are representative of primary modification activities. Twenty-six percent of these are in Level 1, 16% in Level 2, 32% in Level 3, 16% in Level 4, and 5% each in Levels 5 and 6. Secondary modification activities represented by thin biface IIa's *(01-10-04A)* and thin biface IIb's *(01-10-05)* are reflected by one specimen (8%) from the surface, 23% in Level 1, 46% in Level 2, and 8% in Levels 3, 4, and 5, respectively. The final activity set reflecting finished implements and/or maintenance is composed of the point categories *(01-01-00)* and the drill/perforator *(01-02-01A)*. Forty-one percent of these artifacts occur in Level 1, 21% in Level 2, 15% in Level 3, 18% in Level 4, and 6% in Level 5.

Table 75. Vertical distribution of cultural remains from 34Pu-105.

Artifact Variety	Surface	1	2	3	4	5	6	7	8	Total
		Arbitrary Levels (10 cm)								
01-01-01A		8	4	4	1	2				19
01-01-02A					1					1
01-01-02J			1							1
01-01-02Q							1			1
01-01-02V					2					2
01-01-06A		1	1							2
01-01-06B		1								1
01-01-06C				1						1
01-01-06D					1					1
01-01-06I		2								2
01-01-07A		2	1							3
01-02-01A			1							1
01-05-01A		1	3	1	1					6
01-10-01A		1	6	1						8
01-10-02A		2	3	4	3	1				13
01-10-03A		3		2			1			6
01-10-04A		1	3	1	1					6
01-10-05A	1	2	2							5
01-10-05B			2			1				3
01-12-01A		31	23	13	8		2			77
01-13-01A		2	2	2						6
01-13-01B		53	30	16	9	3	1			112
01-15-01A		1								1
01-15-01B		4				2				6
01-16-01A		3489	3190	2318	969	493	348	35	3	10,845
02-01-01A		2	1							3
02-01-01B			1							1
02-03-01A			2			2				4
03-01-01A			1							1
03-01-02A	1	1		1						3
03-01-04A	1			1	1					3
03-02-01A	3									3
03-06-01A				1						1
03-06-03A		1		2						3
04-01-01A					1					1
04-02-01A			1							1
04-02-02A	1	1								2
07-01-01A		1								1
07-01-01C		3	2							5
07-01-01D		1								1
07-01-01E			1							1
07-01-01H		1								1
07-01-02B		2								2
07-03-01A		2								2
08-01-01A	-	-	+	+	+	+	+	+	-	-
09	+	+	+	+	+	+	+	+	-	-
Total	7	3619	3281	2368	998	504	353	35	3	11,168
Stratigraphic Unit		I-II	I-II	III	III	III	IV-V	IV-V	IV-V	

The other chipped stone varieties and categories such as point/biface fragments and segments *(01-12-01A)* and modified and unmodified flakes *(01-13-00* and *01-16-01A)* are most abundant in Level 1 but decline in the deeper levels. Ceramics *(02-01-00)* are also limited to the upper two levels, but plain baked clay specimens *(02-03-01A)* occur in Levels 2 and 5. Ground stone artifacts *(03)* are also concentrated in the upper two levels of the site even though three manos *(03-01-00)*, three miscellaneous ground stone implements *(03-06-00)*, and a single hammerstone *(04-01-01A)* occur in Levels 3 and 4. Historic remains *(07)* are confined to the upper two levels with 73% being recovered in Level 1. Faunal and floral remains *(08* and *09)* were poorly preserved but are represented in almost every level.

Cultural features also tend to be concentrated in the upper levels at the site. One pit-like feature (78-2) was located at a depth of 15 cm while Feature 78-4 (a possible pit or post hole) was noted at 25 cm. The extremely dry condition of the sediments may have prohibited determination of this feature at a high depth. In addition, one pit-like feature excavated in 1976 was found at a depth of 18 cm below ground surface (Bobalik 1977: 519). The other features are rock concentrations, one (78-1) was observed at a depth of 18 cm while the other (78-3) occurred between 38 and 48 cm below ground surface.

Chronology of Site Occupations

The vertical distribution of the cultural remains is rather general overall. However, the distribution of the point categories *(01-01-00)* suggests that two components are present. Large contracting stemmed points *(01-01-01A)* are not temporally sensitive, even though they seem to predominate in the Fourche Maline phase (Galm 1978b: 74-76). On the other hand, expanding stemmed/corner-notched points *(01-01-02)* are more confined to Late Archaic and Woodland components (Galm 1978a: 234; 1978b: 75, Fig. 12), and the small point categories *(01-01-06* and *01-01-07)* are associated with late components in southeast Oklahoma (Brown 1976; Galm 1978b: 76; Galm and Flynn 1978: 157). Bobalik (1977: 551) also notes a separation of the vertical deposits, at the 30 cm level, and suggests that the site may have been used by Late Archaic and early and/or late Caddoan populations. The earlier occupation is distinguished by large projectile point varieties (large contracting stemmed and expanding stemmed corner-notched points). The later occupation is represented by a small point variety *(Washita)* as well as plain, grog and grit tempered pottery *(Williams* and *LeFlore Plain)*, one decorated grog and grit tempered sherd similar to *Spiro Engraved*, *Holly Fine Engraved*, and *Crockett Curvilinear Incised*, and a shell tempered sherd with finger nail punctations similar to specimens at the Harlan site. The component at Harlan has been radiocarbon dated at A.D. 1100 ±75, and the cultural remains correspond closely to similarly dated materials in southeast Oklahoma (Bobalik 1977: 551-552).

The 1978 work did not recover similar pottery with the exception of three *Williams Plain (02-01-01A)* and one *LeFlore Plain (02-01-01B)* sherd. However, the small projectile point varieties *(Scallorn, Bonham, Agee, Agee A, Homan,* and *Morris)* may correlate with Harlan and Spiro phase components (Brown 1976). *Homan* points *(01-01-06D)* have also been recovered from a Fourche Maline component in Arkansas (Brown 1976: 92-93). As indicated earlier (Table 75), these points are restricted primarily to the upper 20 cm of the site, and may be associated with the early Caddoan period (Component 1). This component consisting of arbitrary Levels 1, 2, and possibly 3 (in at least three squares) corresponds closely to Strata I and II.

The earlier component (Component 2) appears to be characterized by a lack of pottery and the presence of expanding stemmed/corner-notched point varieties *(01-01-02)* found primarily in Level 4 (30-40 cm) and Level 6 (50-60 cm). Similar points, as indicated earlier, are confined to Late Archaic and Woodland components in southeast Oklahoma. This component occurs in Levels 3, 4, 5, 6, 7, and 8 and appears to be confined primarily to Stratum III. Two radiocarbon determinations, A.D. 302 ±55 (UGa-2544) and A.D. 616 ±55 (UGa-2545), may date this component. The first (UGa-2544) is from a sample in A44-10 taken at a depth of 10-20 cm which corresponds to the bottom of Stratum II and top of Stratum III at the edge of the northern mound-like area. The other (UGa-2545) is from A58-10 at the apex of this mound-like area at a depth of 25-30 cm, and dates the center of Stratum III.

In addition to these components, a third prehistoric component may also be present at the site. However, the evidence for this is slight at the present time and it may actually represent a part of Component 2. Table 76 presents the distribution of remains recovered from sorting the waterscreened materials in the control square, A58-10. The sorted arbitrary levels (excavated in 5 cm increments) correspond to the various natural strata at the site. From these data there appears to be a substantial increase in the number of flakes between Strata II and III (15 to 20 cm and 35 to 40 cm). Unfortunately, this trend is not reflected in the dry screened material and suggestions regarding this component are speculative. A radiocarbon sample has been submitted for dating the deposits between 35-40 cm (Level 8) in this square but is not available for comment.

A historic component is indicated by the presence of glass, porcelain fragments, and round nails. It is difficult to evaluate this component. The historic debris may represent a structure but could also have been deposited when the site area was in cultivation. There is no evidence of historic structures on the surface. The "purpled" glass *(07-01-01C)* suggests a pre-1917 historic occupation (C. Wallis, personal communication) but the round nails indicate a later time frame.

In summary, at least two prehistoric components are present at 34Pu-105. The earlier component (2) has been radiocarbon dated at A.D. 302 ±55 and A.D. 616 ±55. Chronologically, these dates correspond to the range of dates

(200 B.C.-A.D. 800) assigned to the Fourche Maline phase (Galm and Flynn 1978: 156). However, the artifact assemblages differ slightly.

Contracting stemmed points and plain grog, grit, and bone tempered pottery predominate in the Fourche Maline phase, and the presence of pottery distinguishes it from the earlier Wister phase (Galm and Flynn 1978: 117). As noted in Table 75 no ceramics are associated with Component 2 at 34Pu-105. In addition approximately 50% of the large contracting stemmed points *(01-01-01A)* at 34Pu-105 appear to be associated with Component 2. Approximately 80% of the expanding stemmed/corner-notched points *(01-01-02)* occur in this component. Similar points predominate in Wister phase components (Galm 1978b: 73).

Therefore, it appears that Component 2 can be placed within the chronological range for the Fourche Maline phase. But the material culture is more similar to the Wister phase which ranges from 1500-200 B.C. (Galm and Flynn 1978: 156). Component 2 at 34Pu-105, as a result is tentatively defined as an Archaic/Woodland component. Further refinement of this component must await Phase II investigations at the site.

Component 1 is believed to be associated with an early Caddoan settlement and may be related to the Harlan and Spiro phases. Bobalik (1977: 551-555) describes pottery similar to that found at Harlan and Spiro phase sites and provides a radiocarbon determination of A.D. 1100 ±75 from a feature in which the pottery was found. This determination corresponds very closely with dates associated with the Harlan and Spiro phases at the Williams I site (Galm 1978a: 133). The occurrence of small expanding/stemmed corner-notched *(01-01-06)* and side-notched points *(01-01-07A)*, during the 1978 excavations supports the contention of an early Caddoan component at 34Pu-105.

The final component is a historic component of unknown duration or function which may date to the early 1900s and later.

Lithic Reduction Sequence and Lithic Resource Utilization

An examination of the artifacts indicate that all stages of lithic reduction are represented. These stages consist primarily of a cobble/quarried block bifacial strategy and secondarily of a split cobble reduction sequence. There does appear to be some variation between Components 1 and 2 in terms of the activity sets described earlier in this Chapter. Figure 64 provides a graphic illustration of these differences between components. The Archaic/Woodland component reflects much less emphasis on procurement and initial modification but primary modification and the production and/or maintenance of finished implements seems to be much more important. This may imply that the acquisition of lithic resources near the site was minimal and that cobbles/split pebbles were being prepared at an off-site location with preforms being transported to the site.

Table 76. Vertical distribution of materials recovered from control square A58-10 at 34Pu-105.

	Arbitrary Levels				
Material	2 (5-10 cm)	3 (10-15 cm)	4 (15-20 cm)	8 (35-50 cm)	11 (50-55 cm)
Sample Wt.	500g	500g	500g	500g	500g
Flakes Ct./Wt.	1614/14.5g	1529/38.2g	1366/46.9g	2351/45.1g	1440/19.5g
Seeds and Seed Parts Wt.	0.5g	0.3g	0.3g	0.2g	-
Charcoal Wt.	1.9g	4.2g	1.9g	7.8g*	3.2g
Nutshell Wt.	0.4g	0.4g	1.0g	2.3g	0.7g
Fire-cracked Rock Wt.	53.2g	-	-	-	-
Gravel Wt.	394.55g	444.8g	426.8g	398.1g	435.7g
Miscellaneous Debris Wt.	34.95g	12.1g	23.1g	46.5g	40.9g
Stratigraphic Unit	I-II	II	II	III	IV

*Sample submitted for radiocarbon dating.
Wt. = Weight
Ct. = Count

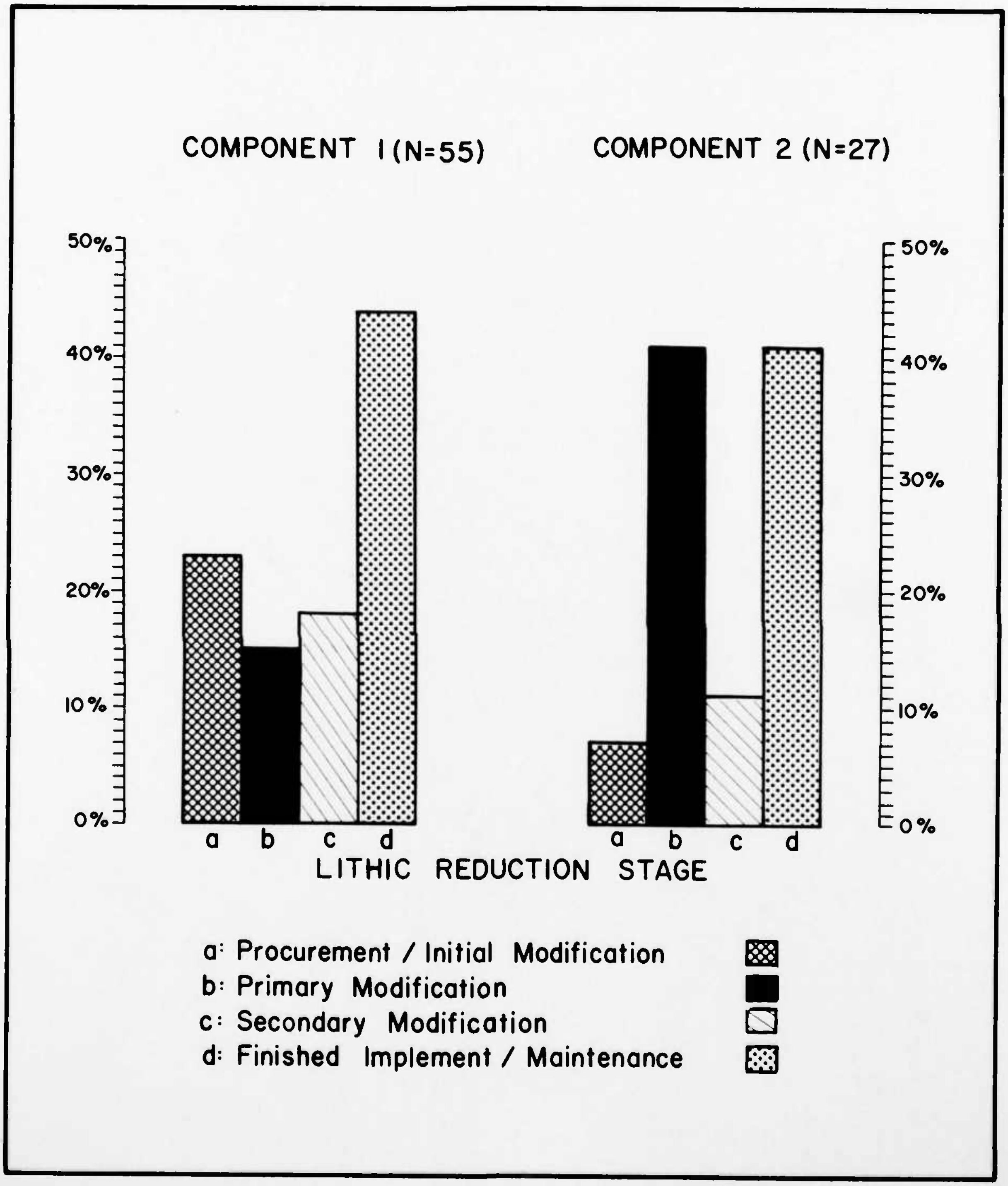


Fig. 64. Bar graphs depicting lithic reduction sequences between components at the Arrowhead Hill site (34Pu-105).

This trend may also be indicated by the fact that 39% (915) of the lithic debitage recovered from Component 2 (Levels 3-8) exhibited cortex.

The single major activity set associated with the early Caddoan component was the production and/or maintenance of finished implements. The other activity sets are also present in significant percentages (Fig. 64) and may indicate that nearby resources were being utilized.

Data regarding the vertical distribution of lithic debitage is provided in Table 77. Table 78 presents lithic resources by artifact variety. Only locally available cherts have been identified, and Type A predominates in all levels as well as in the manufacture of lithic implements. Cortex is present on the majority of bifaces *(01-03-00)* related to procurement, initial modification, and primary modification activity sets. In almost all instances, the cortex is rounded, and may suggest that cobbles and pebbles were collected from local stream gravels near the site. Even though differences occur in percentages of specific lithic types between debitage and tools, these are not considered to be significant. For example, 77% of the debitage is Type A but only 48% of the tools are made from Type A chert. This may indicate the easy availability of this form of chert from nearby stream gravels.

Artifact Assemblages and Functional Considerations

The determination of artifact functions ideally should be conducted through formal functional analyses, especially of chipped stone materials. Traditionally, this has involved interpretations of microscopic wear patterns (cf. Semenov 1964; Wilmsen 1968; Ahler 1971). However, these types of studies are time consuming and require large expenditures of money in comparison to the often minimal amount of information that is obtained. Frison (1968: 154) addresses this problem succinctly.

> Straight forward interpretation may often be shown on only a small percentage of the total specimens. It is as yet difficult to assign tool wear on a working edge to any specific function except within broad limits. Evidence is often difficult to photograph or otherwise preserve in such a way that it may be seen and confirmed by others.

As a result, the approach followed here is, essentially, subjective and closely parallels similar studies by Fowler (1959), Winters (1969), McMillan (1971), and House (1975: 55-74). Macroscopic observations and inferential information were used to help determine the functions of various categories and varieties of artifacts.

Table 77. Distribution of lithic debitage according to horizontal areas of concentration at 34Pu-105[1].

Square	Arbitrary Level (10 cm)	Number	Percentage	Area
A1-14	1	37	26	Southern mound-like area
	2	47	33	
	3	49	34	
	4	10	7	
A20-22	1	240	59	Off-mound, but associated with cultural feature
	2	100	25	
	3	54	13	
	4	11	3	
A20-23	1	219	69	Off-mound, but associated with cultural feature
	2	97	31	
A29-3	1	368	58	Off-mound, but associated with cultural feature
	2	135	21	
	3	100	16	
	4	34	5	
A34-8	1	65	50	Off-mound area
	2	51	40	
	3	13	10	
A38-17	1	540	38	Northern mound-like area
	2	540	38	
	3	280	20	
	4	66	5	
A44-10	1	263	33	Northern mound-like area
	2	290	36	
	3	216	27	
	4	35	4	
	5	3	.03	
A46-15	1	69	37	Off-mound, but eastern edge of tree line
	2	75	41	
	3	39	21	
	4	2	1	
A48-18	1	80	46	Off-mound
	2	66	38	
	3	18	10	
	4	11	6	
A55-12	1	373	18	Northern mound-like area
	2	715	34	
	3	569	27	
	4	233	11	
	5	145	7	
	6	58	3	
	7	1	0	
A58-20	1	365	17	Northern mound-like area
	2	427	20	
	3	432	20	
	4	352	16	
	5	298	14	
	6	278	13	
	7	34	2	
	8	3	0	
A60-5	1	571	39	Northern mound-like area
	2	440	30	
	3	374	26	
	4	73	5	
	5	4	.02	
A63-17	1	75	59	Off-mound
	2	45	35	
	3	7	6	
850-7	1	225	30	Southern mound-like area
	2	163	22	
	3	171	23	
	4	143	19	
	5	44	6	
	6	12	2	

[1] Does not include data from waterscreened square A58-10.

Table 78. Distribution of lithic types by selected artifact variety at 34Pu-105.

Artifact Variety	Lithic Type A	B	C	D	E	F	G	H	I	J	K	Total	%
01-01-01A	8	4	1	1	-	-	1	3	-	1	-	19	6.6
01-01-02A	-	1	-	-	-	-	-	-	-	-	-	1	.4
01-01-02J	1	-	-	-	-	-	-	-	-	-	-	1	.4
01-01-02Q	-	1	-	-	-	-	-	-	-	-	-	1	.4
01-01-02V	1	-	-	1	-	-	-	-	-	-	-	2	.7
01-01-06A	1	-	-	-	-	-	1	-	-	-	-	2	.7
01-01-06B	1	-	-	-	-	-	-	-	-	-	-	1	.4
01-01-06C	1	-	-	-	-	-	-	-	-	-	-	1	.4
01-01-06D	1	-	-	-	-	-	-	-	-	-	-	1	.4
01-01-06I	1	-	-	1	-	-	-	-	-	-	-	2	.7
01-01-07A	2	-	-	1	-	-	-	-	-	-	-	3	1.1
01-02-01A	1	-	-	-	-	-	-	-	-	-	-	1	.4
01-05-01A	3	1	-	-	-	1	-	-	-	1	-	6	2.1
01-10-01A	4	1	-	2	-	-	-	-	-	1	-	8	2.8
01-10-02A	4	3	-	1	-	1	-	2	-	2	-	13	4.6
01-10-03A	2	2	-	-	-	-	-	1	-	1	-	6	2.1
01-10-04A	4	-	-	-	-	-	-	2	-	-	-	6	2.1
01-10-05A	2	1	-	-	-	-	1	1	-	-	-	5	1.8
01-10-05B	1	1	-	-	-	-	-	-	-	1	-	3	1.1
01-12-01A	38	17	2	9	-	-	2	2	-	7	-	77	27.1
01-13-01A	4	-	-	2	-	-	-	-	-	-	-	6	2.1
01-13-01B	53	22	-	19	-	5	1	2	-	10	-	112	39.4
01-15-01A	1	-	-	-	-	-	-	-	-	-	-	1	.4
01-15-01B	1	2	-	3	-	-	-	-	-	-	-	6	2.1
Total	135	56	3	40	-	7	6	13	-	24	-	284	100.3
%	47.5	19.7	1.0	14.1	-	2.5	2.1	4.6	-	8.5	-	100.0	100.0

CHIPPED STONE ASSEMBLAGE

Projectile points *(01-01-00)* are items usually associated with hunting activities. However, it has been demonstrated that larger specimens *(01-01-01A* and *01-01-02)* may also have served as hafted cutting or sawing tools (Ahler 1971). The smaller point categories *(01-01-06* and *01-01-07)*, on the basis of weight and overall form, could have potentially been used as arrow points (Fenenga 1953: 303-323; House 1975). It has been pointed out that small projectile points often do not exhibit diagnostic evidence of wear, and resultant classifications must be made almost exclusively from morphological considerations. Several of the proximal and distal point/biface fragments and segments *(01-12-00)* which are believed to be broken points may also be considered here.

As indicated above, specimens in the large point categories *(01-01-01* and *01-01-02)* may also have served as cutting or sawing tools. In addition to these, several of the bifaces *(01-10-00)* and a tested cobble *(01-15-01B)* exhibit varying amounts of edge retouch, battering, and crushing which may indicate their use as cutting or scraping implements. Modified flakes *(01-13-00)* may also be placed in this group of activities. At least 19 of these exhibit concave edge modification and may have been used as spokeshaves. The remainder have either straight or convex edge modification and may have been used for cutting, sawing, or scraping. Six flakes *(01-05-01A)* exhibit relatively steep distal retouch and most likely served as flake scrapers. The variety of projections *(01-13-01A)* may have functioned as generalized cutting or drilling tools (Lynott 1975: 121-128). In addition, the drill made from a reworked projectile point *(01-02-01A)* is believed to have served as a perforator.

CERAMIC ASSEMBLAGE

Only four pieces of pottery *(02-01-00)* were recovered. These are an undecorated, presumably utilitarian ware. They are believed to have been used as containers, and Winters (1969: 64) considers ceramics to represent domestic equipment.

GROUND AND PECKED/BATTERED STONE ASSEMBLAGES

Many of the items in these classes are considered to be processing tools and are believed to reflect domestic equipment (Winters 1969: 61-64). The manos *(03-01-01)* and metates/grinding slabs *(03-02-01A)* are believed to represent grinding/crushing, possibly of vegetal materials (Ahler and McMillan 1976: 195; House 1975: 72). The miscellaneous ground stone *(03-06-00)* at the site are also believed to have been used in grinding activities. The single hammerstone *(04-01-01A)* may represent generalized hammering activities which may have been used in processing vegetal materials or in pecking

and shaping softer stone implements (Ahler and McMillan 1976: 195). Small, shallow depressions were noted on a number of the ground and pecked/battered artifacts, and a variety of pitted stones have been described. Similar items are believed to have been used as platforms for pounding or hammering activities (Ahler and McMillan 1976: 185). For the most part, the depressions are U-shaped, and it has been demonstrated experimentally that U-shaped pits will occur on sandstone artifacts when they are used to crack nuts or smooth cortex covered cobbles (Spears 1975: 83-116).

Site Functions and Nature of Site Significance

In terms of site functions there do not seem to be many differences in activities conducted between components. Lithic reduction, especially the production and/or maintenance of finished implements, is a significant activity in both components. There is some variation in the activity sets associated with lithic reduction strategies discussed earlier.

Hunting appears to be more predominant during the early Caddoan component and the use of ceramics as containers is presently confined to this component. The remainder of the chipped stone assemblage in both components represent generalized implements probably reflecting cutting, scraping and sawing activities. Ground *(03-01-00)* and pecked/battered stone *(04-01-00)* implements occur in both components but with a greater number in the Archaic/Woodland component. These items are believed to have served in processing activities, especially in the grinding and crushing of floral materials. They may also have served in the pecking and shaping of softer stone implements.

Therefore, it seems that similar activities were carried on through time, although variation in emphases on activities occurs between components. It can be argued that the Archaic/Woodland component represents a special purpose extractive site. The generalized nature of the chipped stone assemblage suggests that some hunting was being conducted but also that cutting, scraping, and sawing activities were carried on. These considerations in conjunction with the ground and pecked/battered implements suggest that perishable items, such as floral remains, were being processed. Also the fact that not all of the lithic reduction sequence is well represented in this component indicates that the site could have been used for extractive activities and may have been seasonally occupied. The rock concentrations (F78-1 and F78-3) may also be associated with this component and may reflect processing activities.

Activities related to the early Caddoan component are also generalized with more emphasis being placed on hunting, cutting, and crushing/grinding activities. Even though maintenance and/or the production of finished implements seems to be important, other activity sets of the lithic reduction continuum are also present in similar percentages. This indicates that the entire range of lithic reduction was undertaken. Also several of the pecked/battered artifacts *(04-01-00)* display U-shaped depressions which, as indicated earlier, could have been used to crack nuts or split cortex covered cobbles.

The generalized nature of the tools, the entire range of the lithic reduction continuum, ceramics, and pit-like features found in the early Caddoan component indicate that the site was used as a base camp. The length of occupation cannot be determined at the present time.

In summary, it appears that during the Archaic/Woodland component the site was utilized as a special purpose extractive site, probably for the collection and processing of vegetal materials on a seasonal basis. On the other hand, the site may have been used as a base camp by early Caddoan populations emphasizing a wide range of activities such as lithic manufacture, hunting, and procurement and processing of perishable items.

SUMMARY

This report presents the results of Phase I excavations and subsequent analysis of materials from the Arrowhead Hill site (34Pu-105). This site will be inundated upon completion of Clayton Lake in southeast Oklahoma. The site is adjacent to Buffalo Creek, and excavations were concentrated on a tree covered mound-like area at the north end of the site.

The report is primarily descriptive but attempts have been made to functionally interpret the site. The earliest use of the site could have occurred during the Archaic/Woodland periods which may date between A.D. 302 ±55 (UGa-2544) and A.D. 616 ±55 (UGa-2545). Material evidence for use of the site during this component is suggested by lithic artifacts found in Levels 3-8 which correspond roughly to Stratum III. Some of the materials associated with this component include large contracting stemmed points, *01-01-01A,* (although similar points also occur in the early Caddoan component) and large expanding stemmed/corner-notched points *(01-01-02)*. The latter are confined almost exclusively to Stratum III (Level 4). Other lithic artifacts as well as ground stone *(03)* and battered/pecked implements *(04)* also occur and comprise part of this aggregate. No ceramics are associated with this component. This occupation is similar to other Archaic/Woodland manifestations such as the Wister and Fourche Maline phases in eastern Oklahoma which are dated between 1500-200 B.C. and 200 B.C. to A.D. 800, respectively (Galm and Flynn 1978: 156). The closest parallels in the Jackfork Basin may be to 34Lt-32 and 34Pu-111 (this report) and 34Lt-21, 34Lt-25, 34Lt-30, 34Pu-75, 34Pu-77, and 34Pu-83 (Bobalik 1977: 567).

Another occupation occurred during the early Caddoan period which has been radiocarbon dated at A.D. 1100. Material remains from this component are similar to the Harlan and Spiro phases (Bobalik 1977: 551-552). Artifacts associated with this component include grog, grit, and bone tempered ceramics *(02-01-01)*, and a decorated grog and grit tempered sherd, and punctated shell tempered pottery (Bobalik 1977: 552). The former have been interpreted as belonging to the Harlan phase which may predate A.D. 1200 (Brown 1972: 220). The latter pottery (decorated grog and grit tempered and shell tempered) is similar to sherds recovered from the Harlan (34Ck-6) and Payne (34CH-53) sites (Brown 1971: 82-92, 109-120; Bell 1972: 251;

Rohrbaugh 1973: 143-148). In addition, the varieties of small (arrow) points represented *(01-01-06* and *01-01-07)* are similar to types associated with the Harlan and Spiro phases (Brown 1976; Galm 1978a: 133). Other artifacts associated with this component are similar to those defined with the Archaic/Woodland component at 34Pu-105. The closest parallels in the Jackfork Basin may be 34Lt-22, 34Lt-27, and 34Pu-99 (Bobalik 1977: 571). In addition, upper components at 34Pu-74 (this report) may be related to 34Pu-105.

Several conclusions may be offered regarding the use of the site during the two prehistoric components.

1. Overall activities between the two components are similar. There is a change, however, in activity sets associated with the lithic reduction continuum. During the Archaic/Woodland component less emphasis is placed on lithic procurement/initial modification and secondary modification. The production and/or maintenance of finished implements is emphasized in both components. Hunting appears to be less important and the use of grinding slightly more important during the Archaic/Woodland component.

2. Artifact preparation was conducted during both components. It appears that local lithic resources were being collected from stream gravels. During the Archaic/Woodland component these materials had already been processed to some degree before being brought to the site.

3. Use of the site during the Archaic/Woodland component may be as a seasonal, special purpose extractive site and as a base camp during the early Caddoan occupation. Qualitative functional interpretations suggest that many chipped stone tools were used for scraping and/or cutting. The occurrence of ground stone tools indicates that processing, probably of floral material, was also important.

4. The determination of seasonality and longevity of site occupations is hampered by the lack of floral and faunal materials.

5. These components comprise a segment of the Archaic/Woodland and early Caddoan settlement-subsistence patterns. Initially, the site was used as a special purpose extractive site probably by transient populations on a seasonal basis. Whether these were resident populations within the Jackfork Valley or entered the valley from other areas such as the Wister Valley or Red River is currently unknown. The same situation holds true for the early Caddoan occupation, but the site seems to have been used as a base camp. If the feature located by Bobalik (1977: 519-520) and those recorded in 1978 are associated with the Caddoan component it appears that intrasite activity areas may be associated with these base camps. There is no indication of horticultural activities associated with either component, but floral resources are being utilized as indicated by grinding implements.

Admittedly, some conclusions presented here are based on limited and in some cases negative evidence, but with revisions they provide hypotheses to be tested during Phase II investigations.

CHAPTER 14

TEST EXCAVATIONS AT THE BUFFALO BEND SITE (34Pu-111)

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INTRODUCTION

This site was located during the summer of 1978 and limited test excavations were conducted in December 1978 (Vehik 1979). This is a fairly large site covering approximately an 110 m by 90 m area along the east side of Buffalo Creek. Intermittent streams flowing into Buffalo Creek occur along the north and west sides of the site. It is on a low terrace about 560 feet (171 m) above sea level. Original vegetation in this area probably included grasses and oak trees, but the ground cover was recently removed by heavy machinery which has disturbed from 5-10 cm of the top soil. Presently, part of the site is covered by sparse grass, but the majority lacks ground cover (Fig. 65 a). Several depressions are present due to uprooting large trees and there are a number of large tree and brush piles. The vegetational cover was removed because part of this area was planned to be used as a borrow area for constructing the proposed Clayton Dam and Lake.

The site was recommended for testing for several reasons: 1) The recovered surface artifacts suggested that the major occupation is related to the Fourche Maline phase (cf. Galm 1978b: 174); 2) The wide variety of cultural remains recovered from the surface indicates that it may have been a base camp, and the fact that small fragments of burned clay were found suggested the potential for a structure or fire-related feature at the site; 3) The site is approximately 20-40 m west of several rock features (34Pu-112) and approximately 805 m northeast of 34Pu-74, where at least two structures are present; and 4) The integrity of the site would be destroyed if this locale was used as a borrow area for the construction of Clayton Lake.

EXCAVATION STRATEGIES

As mentioned previously, test excavations were conducted last December. Initially, a horizontal grid system was devised by establishing north-south and east-west base lines from an arbitrary datum point designated S0-E0. Excavation units were designated in 1 m intervals and are referred to by the southeast corner stake. Thus, the first square, 34 m west of the north-south base line and 6 m south of the east-west

base line, was designated S6-W34. Seven 1 m squares were excavated. Figure 66 presents a plan of the site.

Excavations were conducted by using conventional hand tools such as pick-mattocks, shovels, and trowels. Arbitrary 10 cm levels were used throughout the excavations. Natural strata were difficult to discern while excavating and could not be used to separate cultural components. All levels were screened through ¼-inch mesh hardware cloth. An effort was made to locate artifacts *in situ*. Horizontal coordinates were plotted using distances north and west of the south and east grid lines in each square. All vertical measurements were taken from the surface at the southeast corner of each square. Artifacts including recognizable lithic tools were placed in individual plastic bags with an identifying tag in order to limit field and lab-induced edge damage.

STRATIGRAPHY

Figure 67 provides an illustration of the stratigraphy at the site. Three strata were noted in S6-W34 and N10-W34 but only two were observed in N39-E9. Stratigraphic profiles were not obtained from the other squares. An A_p horizon, presumably present on this terrace, is missing because of the land clearing activities. All of the sediments were moist and retained water relatively well. Color designations were derived from moist samples (Munsell Soil Color Charts 1975).

Stratum I

This stratum varies between 18 cm and 42 cm in thickness. It is composed of a compact loam containing numerous moderate-sized roots and abundant amounts of cultural material. Very few rocks were observed in the strata associated with N39-E9, but large numbers of rocks occurred in units S6-W34 and N10-W34. These rocks are subangular to rounded and range between pebble and gravel size with the former being predominant. Colors vary from dark brown (7.5YR 3/2) to dark yellowish brown (10 YR 4/4).

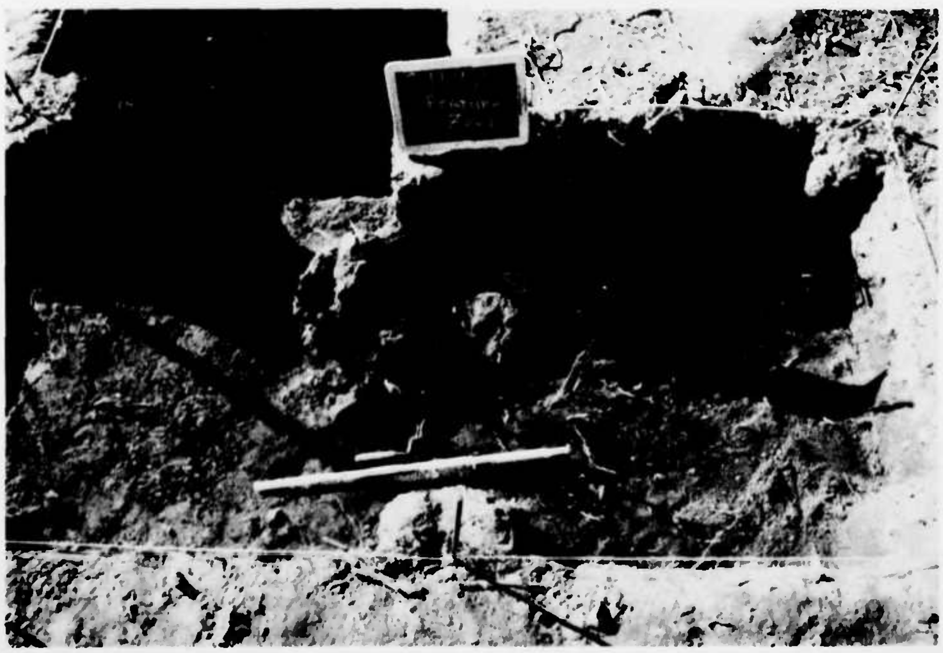
Stratum II

The interface between Strata I and II was relatively difficult to discern, probably because of differential drying. Stratum II varies between 18 cm and 42 cm in depth and ranges in thickness between 16-24 cm, with an average of 19 cm. Sediments are less compact than Stratum I and are also included in the loam textural class. With the exception of N39-E9, they contain substantial amounts of subangular to rounded rocks.

Fig. 65. a: Photograph showing the Buffalo Bend site (34Pu-111) during testing activity.

b: Photograph of Feature 78-1 in squares N43-E40 and N44-E40.

a



b